Innovation, Science and Economic Development Canada

Innovation, Sciences et Développement économique Canada

Spectrum Management and Telecommunications

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Basic Qualification Question Bank for Amateur Radio Operator Certificate Examinations

Canada

Foreword:
This question bank contains the questions that should be used effective the date printed on the title page for administering Basic Qualification examinations for the Amateur Radio Operator Certificate.
The correct choice of the four suggested answers appears in brackets following each question identifier. i.e. B - 001 - 001 - 001 (A)

While every reasonable effort has been made to ensure accuracy in this document, no warranty is expressed or implied.

Candidates for amateur radio operator certificate examinations are encouraged to contact the following amateur radio organizations for information on study material.

Radio Amateurs of Canada: www.rac.ca

Fédération des clubs radioamateurs du Québec (RAQI) : www.raqi.ca

Instructions for examiners are contained in Radiocommunication Information Circular 1, RIC - 1 - Guide for Examiners Accredited to Conduct Examinations for Amateur Radio Operator Certificates
For additional information, please contact the Amateur Radio Service Centre (ARSC) at the following address:

Innovation, Science and Economic Development Canada
Amateur Radio Service Centre
2 Queen Street East
Sault Ste. Marie, ON
P6A 1Y3

Email: spectrumamateur - spectreamateur@ised - isde.gc.ca
Telephone: 1 - 888 - 780 - 3333 (Toll free)
Fax: 1 - 705 - 941 - 4607

B-001-001-001 **(A)**

Which document assigns the authority to make Canadian regulations governing radiocommunications?

A The Radiocommunication Act
B The Broadcasting Act
C The Standards for the Operation of Radio Stations in the Amateur Radio Service
D The International Telecommunication Union's Radio Regulations

B-001-001-002 **(D)**

Which document assigns the authority to publish Standards for the Operation of Radio Stations in the Amateur Radio Service in Canada?

A The Radiocommunication Regulations
B The Broadcasting Act
C The International Telecommunication Union's Radio Regulations
D The Radiocommunication Act

B-001-001-003 **(A)**

Which department is responsible for the administration of the Radiocommunication Act?

A Innovation, Science and Economic Development Canada
B Transport Canada
C Communications Security Establishment Canada
D National Defence

B-001-001-004 **(A)**

Which document defines the Canadian "amateur radio service"?

A The Radiocommunication Regulations
B The Radiocommunication Act
C The Standards for the Operation of Radio Stations in the Amateur Radio Service
D The Radio Systems Policies

B-001-002-001 **(B)**

What must you do within 30 days of a mailing address change?

A Inform Radio Amateurs of Canada (RAC)
B Inform Innovation, Science and Economic Development Canada
C Inform your local amateur radio club
D Inform an accredited examiner

B-001-002-002 **(C)**

An Amateur Radio Operator Certificate is valid for:

A three years
B one year
C life
D five years

B-001-002-003 **(D)**

Whenever a change of address is made:

A you must notify Innovation, Science and Economic Development Canada within 14 days of operation at the new address
B you must not operate until a change of address card is forwarded to Innovation, Science and Economic Development Canada
C within the same province, you do not need to notify Innovation, Science and Economic Development Canada
D you must notify Innovation, Science and Economic Development Canada within 30 days of a change of mailing address

B-001-002-004 **(C)**

The Amateur Radio Operator Certificate:

A must be kept in a safe place
B must be kept on the person to whom it is issued
C must be retained at the station
D must be put on file

B-001-002-005 **(A)**

A radio inspector asks to see your Amateur Radio Operator Certificate, or a copy thereof. Per the regulations, how many hours are you given to comply?

A 48
B 12
C 24
D 72

B-001-002-006 **(C)**

What is the fee for a first Amateur Radio Operator Certificate?

A $10
B $24
C Free
D $32

B-001-002-007 **(A)**

The Amateur Radio Operator Certificate should be:

A retained at the address provided to Innovation, Science and Economic Development Canada
B retained in a safety deposit box
C retained on the holder's person
D retained in the holder's vehicle

B-001-002-008 **(C)**

What is the fee to issue a replacement call sign with a new prefix, due to a change in address to a new province or territory?

A $40
B $60
C Free
D $25

B-001-002-009 **(D)**

What is the fee for changing an existing call sign (including changing to a two-letter call sign)?

A $55
B $30
C Free
D $60

B-001-003-001 **(A)**

Transmissions outside of amateur radio bands:

A are prohibited and penalties could be assessed to the control operator
B must be identified with your call sign
C are permitted when using less than 1 watt
D are permitted for short tests only

B-001-003-002 **(A)**

What is the term in the regulations that defines if an amateur radio operator falsely transmits the word "MAYDAY" when there isn't an emergency?

A A false or fraudulent message
B An encrypted message
C An emergency test transmission
D A privileged communication

B-001-003-003 **(A)**

Transmitting a false or fraudulent distress signal or message is prohibited. The person found guilty is liable to what penalty?

A A fine, not exceeding $5 000, or a prison term not exceeding one year, or both
B A fine of $10 000
C A prison term of two years
D A fine not exceeding $1 000

B-001-003-004 **(B)**

Which government document states the offences and penalties relating to radiocommunications?

A The Radio Systems Policies
B The Radiocommunication Act
C The Broadcasting Act
D The Radiocommunications Regulations

B-001-003-005 **(B)**

Which of the following is NOT correct? The Minister of Innovation, Science and Industry may suspend an Amateur Radio Operator Certificate:

A where the holder has failed to comply with a request to pay fees or interest due
B with no notice, or opportunity to make representations thereto
C where the holder has contravened the Radiocommunication Act, its regulations, or the terms and conditions of the certificate
D where the certificate was obtained through misrepresentation

B-001-003-006 **(B)**

Which of the following statements is NOT correct?

A The person responsible for a dwelling entered by a radio inspector shall provide the inspector the requested information
B A radio inspector may enter a dwelling without the consent of the occupant and without a warrant
C Where entry is refused, and is necessary to perform their duties under the Radiocommunication Act, a radio inspector may obtain a warrant
D In executing a warrant, a radio inspector shall not use force, unless accompanied by a peace officer, and force is authorized

B-001-003-007 **(D)**

When is an amateur radio operator permitted to transmit false information?

A To play a practical joke, for example, giving incorrect location of an amateur radio event

B To conceal their identity when responding to inappropriate on-air conduct

C To exaggerate the scope of an emergency to obtain help more rapidly

D Transmitting false information is never permitted

B-001-003-008 **(A)**

Interfering with, or obstructing any radio communication, without lawful cause, is prohibited. The person found guilty is liable to what penalty?

A A fine, not exceeding $5 000, or a prison term not exceeding one year, or both

B A fine of $10 000

C A prison term of two years

D A fine not exceeding $1 000

B-001-004-001 **(C)**

How old must you be to hold an Amateur Radio Operator Certificate with Basic Qualification?

A 18 years or older

B 14 years or older

C There are no age limits

D 70 years or younger

B-001-004-002 **(D)**

Which examination must be passed before an Amateur Radio Operator Certificate is issued?

A A practical test

B Morse code

C Advanced Qualification

D Basic Qualification

B-001-004-003 **(D)**

Holders of which one of the following certificates may be issued an Amateur Radio Operator Certificate?

A Canadian Restricted Operator Certificate - Maritime (ROC-M)

B Canadian Restricted Operator's Certificate - Maritime Commercial (ROC-MC)

C Canadian Restricted Operator Certificate - Aeronautical (ROC-A)

D Canadian Radiocommunication Operator General Certificate Maritime (RGMC)

B-001-004-004 **(B)**

After an Amateur Radio Operator Certificate with Basic Qualification is issued, the holder may be examined for additional qualifications in the following order:

A Advanced after passing Morse code

B any order

C Morse code after passing the Advanced

D Morse code after passing the Basic with Honours

B-001-004-005 **(C)**

What sending and receiving speed, in words per minute (wpm), must you achieve to be granted the Morse code Qualification?

A 7 wpm

B 15 wpm

C 5 wpm

D 12 wpm

B-001-004-006 **(B)**

You hold an Amateur Radio Operator Certificate with Advanced Qualification. Besides the amateur radio service, in what other service does this authorization allow you to operate a station?

A Land mobile service

B No other service

C Aeronautical service

D Maritime service

B-001-004-007 **(D)**

What conditions must candidates for amateur radio certification meet?

A Be a Canadian citizen

B Be a Canadian citizen or permanent resident

C Be at least 14 years of age and a Canadian citizen or permanent resident

D Have a valid address in Canada

B-001-005-001 **(D)**

Under what circumstances can an amateur radio operator with an Advanced Qualification install, place in operation, modify or repair radio apparatus on behalf of another person?

A Pending the granting of a radio authorization, if the apparatus covers amateur radio and commercial bands

B Pending the granting of an Amateur Radio Operator Certificate if the apparatus covers amateur radio bands only

C Pending the granting of an authorization if the apparatus is certified and crystal controlled

D If the other person holds an authorization for this apparatus

B-001-005-002 **(A)**

Under what circumstances can an amateur radio operator reprogram a land mobile transmitter on behalf of another person for use on 2 metres?

A Only if the other person holds an Amateur Radio Operator Certificate

B Only if an amateur radio operator with an Advanced Qualification performs the modification

C Only if the other person holds an Advanced Qualification

D Only if the other person holds a Basic with Honours Qualification

B-001-005-003 **(B)**

What regulatory requirement must be met to allow you to install an amateur radio transmitter on behalf of another person?

A The other person must be enrolled in an amateur radio certification course

B Both you and the other person must hold Amateur Radio Operator Certificates

C Only the other person must hold an Amateur Radio Operator Certificate

D Only you must hold an Amateur Radio Operator Certificate

B-001-005-004 **(A)**

An amateur radio operator with Basic and Morse code qualifications may install an amateur radio station for another person:

A only if the other person is the holder of a valid Amateur Radio Operator Certificate

B only if the final power input does not exceed 100 watts

C only if the station is for use on one of the VHF bands

D only if the DC power input to the final stage does not exceed 200 watts

B-001-005-005 **(D)**

What regulatory requirement must be met to allow you to repair an amateur radio transmitter on behalf of another person?

A Only the other person must hold an Amateur Radio Operator Certificate

B Only you must hold an Amateur Radio Operator Certificate

C The other person must be enrolled in an amateur radio certification course

D Both you and the other person must hold Amateur Radio Operator Certificates

B-001-005-006 **(A)**

What regulatory requirement must be met to allow you to place an amateur radio transmitter in service on behalf of another person?

A Both you and the other person must hold Amateur Radio Operator Certificates

B Only the other person must hold an Amateur Radio Operator Certificate

C Only you must hold an Amateur Radio Operator Certificate

D The other person must be enrolled in an amateur radio certification course

B-001-006-001 **(B)**

An amateur radio station with a maximum power output of 2 watts:

A is exempt from regulatory control

B must be under the supervision of a person holding an Amateur Radio Operator Certificate and call sign

C need not be authorized by Innovation, Science and Economic Development Canada

D need not be authorized in isolated areas only

B-001-006-002 **(A)**

An amateur radio station may be used to communicate with:

A stations operated under similar authorizations

B any stations which are identified for special contests

C Armed Forces stations during contests and exercises

D any station transmitting in amateur radio bands

B-001-006-003 **(C)**

Under what circumstances is an amateur radio operator permitted to use an amplifier to amplify the output of a licence-exempt transmitter?

A Only for short test transmissions

B When other users will not be interfered with

C This is not permitted

D When emissions will be outside amateur radio frequency allocations

B-001-006-004 **(D)**

When is it permissible to use amateur radio equipment, with or without modification, to transmit outside amateur radio bands?

A When the control operator holds an Advanced Qualification

B When the operator already owns licensed equipment for such frequencies

C When transmissions are limited to licence-exempt frequencies

D Never, amateur radio equipment is not certified for operation outside amateur radio bands

B-001-006-005 **(B)**

Which of the following statements is NOT correct? A person may operate radio apparatus, authorized in the amateur radio service:

A except for the amplification of the output power of licence-exempt radio apparatus operating outside authorized amateur radio service allocations

B on aeronautical, marine or land mobile frequencies

C only if the person complies with the Standards for the Operation of Radio Stations in the Amateur Radio Service

D only if the apparatus is maintained to the performance standards set by Innovation, Science and Economic Development Canada regulations and policies

B-001-006-006 **(A)**

Some VHF and UHF FM radios purchased for use in the amateur radio service can also be programmed to communicate on frequencies used for the land mobile service. Under what conditions is this permissible?

A The radio is certified and licensed for use in the land mobile service

B The radio operator has a Restricted Operator's Certificate

C The equipment has an RF power output of 2 watts or less

D The equipment is used in remote areas north of 60 degrees latitude

B-001-007-001 **(B)**

Which of the following topics is prohibited on an amateur radio club net?

A Emergency planning

B Business planning

C Recreation planning

D Code practice planning

B-001-007-002 **(A)**

When is an amateur radio operator allowed to broadcast information to the general public?

A An amateur radio operator may never broadcast to the general public

B Only when the amateur radio operator is being paid

C Only when the broadcasts last less than 1 hour

D Only when the broadcasts are of broad public interest

B-001-007-003 **(A)**

Which of the following statements is NOT correct?

A An amateur radio operator may conduct occasional business on the air
B A considerate amateur radio operator does not transmit unnecessary signals
C A courteous amateur radio operator refrains from using offensive language
D An amateur radio operator does not obscure the meaning of their transmissions

B-001-007-004 **(A)**

Which of the following one-way communications may NOT be transmitted in the amateur radio service?

A Broadcasts intended for the general public
B Radio control commands to model craft
C Brief transmissions to make adjustments to the station
D Morse code practice

B-001-007-005 **(B)**

Under what condition are you permitted to use a new digital encoding technique that you developed to transmit data over amateur radio bands?

A When it includes sending the amateur radio station's call sign
B When it is published in the public domain
C When it is used for music streaming content
D When it is used for commercial traffic

B-001-007-006 **(C)**

When may an amateur radio station transmit an encoded message?

A Only during contests
B Only when transmitting above 450 MHz
C Only when the encoding or cipher is not secret
D Only during a declared communications emergency

B-001-007-007 **(C)**

What are the restrictions on the use of abbreviations or procedural signals in the amateur radio service?

A They are not permitted because they obscure the meaning of a message to government monitoring stations
B Only "10 codes" are permitted
C They may be used if the signals or codes are not secret
D There are no restrictions

B-001-007-008 **(B)**

What should you do to keep your amateur radio station from retransmitting music or signals from a non-amateur radio station?

A Adjust your transceiver noise blanker
B Turn down the volume of background audio
C Turn up the volume of your transmitter
D Speak closer to the microphone to increase your signal strength

B-001-007-009 **(A)**

The transmission of a secret code by the operator of an amateur radio station:

A is not permitted
B is permitted for contests
C must be approved by Innovation, Science and Economic Development Canada
D is permitted for third-party traffic

B-001-007-010 **(C)**

An amateur radio operator may be engaged in communications including the transmission of:

A radiocommunication in support of industrial, business, or professional activities
B commercially recorded material
C Q codes
D programming that originates from a broadcasting undertaking

B-001-007-011 **(A)**

In the amateur radio service, business communications:

A are not permitted under any circumstance
B are permitted on some bands
C are only permitted if they are for the safety of life or immediate protection of property
D are not prohibited by regulation

B-001-008-001 **(D)**

Where may holders of an Amateur Radio Operator Certificate operate an amateur radio station in Canada?

A Anywhere in Canada only during times of emergency
B Only at the address shown on Innovation, Science and Economic Development Canada records
C Only within their province or territory
D Anywhere in Canada

B-001-008-002 **(D)**

Which type of station may transmit one-way communications?

A Repeater station
B HF station
C VHF station
D Beacon station

B-001-008-003 **(A)**

What minimum qualifications must an amateur radio operator hold to assemble commercially available transmitter kits of professional design?

A Basic
B Basic with Honours
C Basic and Morse code
D Basic and Advanced

B-001-008-004 **(D)**

What minimum qualifications must an amateur radio operator hold to install a repeater operating on a single band in a voice mode?

A Basic and Morse code
B Basic with Honours
C Basic
D Basic and Advanced

B-001-008-005 **(C)**

What minimum qualifications must an amateur radio operator hold to install an amateur radio club station?

A Basic
B Basic with Honours
C Basic and Advanced
D Basic, Advanced and Morse code

B-001-008-006 **(B)**

What minimum qualifications must an amateur radio operator hold to install or operate a transmitter or RF amplifier that is neither professionally designed nor commercially manufactured for use in the amateur radio service?

A Basic, Advanced and Morse code
B Basic and Advanced
C Basic with Honours
D Basic and Morse code

B-001-008-007 **(D)**

What minimum qualifications must an amateur radio operator hold to operate cross-band repeaters?

A Basic with Honours
B Basic and Morse code
C Basic and Advanced
D Basic

B-001-008-008 **(D)**

What minimum qualifications must an amateur radio operator hold to remotely operate a transmitter, including changing frequency, emission mode or output power?

A Basic and Morse code
B Basic with Honours
C Basic
D Basic and Advanced

B-001-009-001 **(A)**

Who is responsible for the operation of an amateur radio station?

A Both the control operator and the station owner
B Only the station owner who is the holder of an Amateur Radio Operator Certificate
C The person who owns the station equipment
D Only the control operator

B-001-009-002 **(B)**

If you transmit from another amateur radio station, who is responsible for its operation?

A The station owner
B Both of you
C You
D The station owner, unless the station logbook shows you as the control operator

B-001-009-003 **(C)**

What is your responsibility as a station owner?

A You must be present whenever the station is operated
B You must notify Innovation, Science and Economic Development Canada if another amateur radio operator acts as the control operator
C You are responsible for the operation of the station in accordance with the regulations
D You must allow another amateur radio operator to operate your station upon request

B-001-009-004 **(B)**

Who may be the control operator of an amateur radio station?

A Any person over 21 years of age
B Any qualified amateur radio operator chosen by the station owner
C Any person over 21 years of age with a Basic Qualification
D Any person over 21 years of age with Basic and Morse code qualifications

B-001-009-005 **(D)**

When must an amateur radio station have a control operator?

A A control operator is not needed
B Whenever the station receiver is operated
C Only when training another amateur radio operator
D Whenever the station is transmitting

B-001-009-006 **(C)**

When an amateur radio station is transmitting, where must its control operator be?

A At the station's entrance, to control entry to the room
B Anywhere within 50 km of the station location
C At the station's control point
D Anywhere in the same building as the transmitter

B-001-009-007 **(B)**

Why can't family members without qualifications transmit using your amateur radio station if they are alone with your equipment?

A They must first know the right frequencies and emission modes for transmitting
B They must hold suitable amateur radio qualifications before they are allowed to be control operators
C They must not use your equipment without your permission
D They must first know how to use the right abbreviations and Q signals

B-001-009-008 **(C)**

The owner of an amateur radio station may:

A permit anyone to use the station without restrictions
B permit anyone to use the station and take part in communications
C permit any person to operate the station under the supervision and in the presence of the holder of an Amateur Radio Operator Certificate
D permit anyone to take part in communications only if prior written permission is received from Innovation, Science and Economic Development Canada

B-001-009-009 **(A)**

Under what circumstances can a person who does NOT have an Amateur Radio Operator Certificate operate an amateur radio station?

A When the person is under supervision, and in the presence of, a person holding appropriate qualifications
B When the person has been briefed over the telephone by a person holding appropriate qualifications
C When the person is actively enrolled in an amateur radio course
D When the person holds a valid licence in the land mobile or maritime services

B-001-010-001 **(B)**

What is a transmission that disturbs other communications called?

A Unidentified transmissions
B Harmful interference
C Interrupted CW
D Transponder signals

B-001-010-002 **(B)**

When may you deliberately interfere with another amateur radio station's communications?

A Only when you are operating within crowded band conditions
B Deliberate interference is never acceptable
C Only if the station is operating illegally
D Only if the station begins transmitting on a frequency you are using

B-001-010-003 **(A)**

If the regulations say that the amateur radio service is a secondary user of a frequency band, and another service is a primary user, what does this mean?

A Amateur radio operators are allowed to use the frequency band only if they do not cause interference to primary users
B Nothing special: all users of a frequency band have equal rights to operate
C Amateur radio operators are only allowed to use the frequency band during emergencies
D Amateur radio operators can only use the band briefly for radio testing and adjustment purposes

B-001-010-004 **(A)**

What rule applies if two amateur radio operators want to use the same frequency?

A Both station operators have an equal right to operate on the frequency
B The station operator with a lesser qualification must yield the frequency to an operator of higher qualification
C The station operator with a lower power output must yield the frequency to the station with a higher power output
D Station operators in regions 1 and 3 of the International Telecommunication Union must yield the frequency to stations in region 2

B-001-010-005 **(B)**

What name is given to a form of interference that seriously degrades, obstructs or repeatedly interrupts a radiocommunication service?

A Disruptive interference
B Harmful interference
C Intentional interference
D Adjacent interference

B-001-010-006 **(C)**

In the event the Minister of Innovation, Science and Industry determines that an amateur radio station causes harmful interference, what are the Minister's powers?

A Delegate the matter to the Canadian Radio-television and Telecommunications Commission
B Convene the parties to arrive at a compromise solution
C Order the station's operation to cease or change
D Revoke the amateur radio operator's certificate without giving written notice

B-001-010-007 **(A)**

Amateur radio operation must not cause interference to other radio services operating in which of the following bands?

A 430.0 MHz to 450.0 MHz
B 7.0 MHz to 7.1 MHz
C 144.0 MHz to 148.0 MHz
D 14.0 MHz to 14.2 MHz

B-001-010-008 **(D)**

Amateur radio operations are NOT protected from interference caused by another service operating in which of the following frequency bands?

A 144 MHz to 148 MHz
B 222 MHz to 225 MHz
C 50 MHz to 54 MHz
D 902 MHz to 928 MHz

B-001-010-009 **(A)**

Under what circumstances may the operator of an amateur radio station conduct test transmissions?

A When the transmission will not cause interference to stations in the amateur radio service or other services
B When transmitting in designated sub-bands
C Only between the hours of midnight and 8:00 AM
D After warning other stations who might be interfered with

B-001-010-010 **(D)**

Which of these amateur radio bands may be heavily occupied by licence-exempt devices?

A 3.5 MHz to 4.0 MHz
B 430 MHz to 450 MHz
C 135.7 kHz to 137.8 kHz
D 902 MHz to 928 MHz

B-001-011-001 **(C)**

Amateur radio stations may communicate:

A with non-amateur radio stations
B with any station involved in a real or simulated emergency
C only with other amateur radio stations
D with anyone who uses international Morse code

B-001-011-002 **(C)**

During relief operations in the days following a disaster, when may you use your amateur radio equipment to communicate on frequencies outside amateur radio bands?

A When messages are destined to agencies without amateur radio support
B When normal communication systems are overloaded, damaged or disrupted
C Using frequencies outside amateur radio bands is never permitted
D When relaying messages on behalf of government agencies

B-001-011-003 **(B)**

If you hear an unanswered distress signal on an amateur radio band where you do NOT have privileges to communicate:

A you may not respond nor offer assistance
B you may respond and offer assistance
C you may respond and offer assistance using international Morse code only
D you may respond and offer assistance after obtaining permission from Innovation, Science and Economic Development Canada

B-001-011-004 **(C)**

In the amateur radio service, it is permissible to broadcast:

A commercially recorded material
B programming that originates from a broadcast undertaking
C radio communications required for the safety of life and property
D music that is picked up by your microphone

B-001-011-005 **(C)**

An amateur radio operator in distress may:

A use any means of radiocommunication, but only on internationally recognized emergency channels
B only use Morse code communications on internationally recognized emergency channels
C use any means of radiocommunication
D only use bands for which the operator is authorized

B-001-011-006 **(A)**

During a disaster, when may an amateur radio station make transmissions necessary to meet essential communication needs and assist relief operations?

A When normal communication systems are overloaded, damaged or disrupted
B Never, only official emergency stations may transmit in a disaster
C When normal communication systems are working but are not convenient
D Only when the local emergency net is activated

B-001-011-007 **(D)**

What transmitter power limitations must be observed by an amateur radio operator in distress?

A 2250 watts PEP
B 750 watts carrier power
C 1000 watts DC input
D No limitations

B-001-011-008 **(A)**

What is expected of operators NOT directly involved in a disaster relief net?

A Avoid needless transmissions on or near the net frequency
B Defer communications until net activity is less intense
C Limit operation to narrow bandwidth digital modes
D Choose another band with a shorter distance reach

B-001-011-009 **(B)**

When may amateur radio operators handle messages from recognized public service agencies?

A When operators have an Advanced Qualification
B During peace time, civil emergencies and exercises
C When data modes are used exclusively
D When special authorization has been obtained from Innovation, Science and Economic Development Canada

B-001-011-010 **(C)**

When are you permitted to interfere with another station's transmissions?

A When you both wish to contact the same station
B When the other station is interfering with your transmission
C When your station is directly involved with a distress situation
D When the other station is not operating in accordance with the Radiocommunication Regulations

B-001-012-001 **(B)**

What kind of payment is allowed for third-party messages sent by an amateur radio station?

A Any amount agreed upon in advance
B No payment of any kind is allowed
C Donation of amateur radio equipment
D Donation of equipment repairs

B-001-012-002 **(A)**

Radiocommunications transmitted by stations other than a broadcasting station may be divulged or used:

A if it is transmitted by an amateur radio station
B if the other station is using digital means
C if transmitted in English or French
D during peacetime civil emergencies

B-001-012-003 **(A)**

When may an amateur radio operator demand or accept remuneration for exchanging messages?

A Never, it is expressly prohibited
B When a gift or gratuity replaces remuneration
C When a non-governmental organization is involved
D When the messages are exchanged outside a real emergency

B-001-012-004 **(B)**

With regard to divulging the content of radiocommunications other than broadcasting, which of the following is an offence?

A Where it is on behalf of Canada, for the purpose of national defence or security
B Where it is for the purpose of answering questions from a media organization
C Where it is for the purpose of protecting property or preventing harm
D Where it is for the purpose of giving evidence in a criminal or civil court

B-001-013-001 **(B)**

Which of the following call signs is a valid Canadian amateur radio call sign?

A KA9OLS
B VA3RAC
C SM2CAN
D BY7HY

B-001-013-002 **(A)**

How often must an amateur radio station be identified?

A At least every thirty minutes, and at the beginning and at the end of a contact
B At the beginning of a contact and at least every thirty minutes after that
C At least once during each transmission
D At the beginning and end of each transmission

B-001-013-003 **(C)**

What do you transmit to identify your amateur radio station?

A Your first name and your location
B Your full name
C Your call sign
D Your "handle"

B-001-013-004 **(A)**

What identification, if any, is required when two amateur radio stations begin communications?

A Each station must transmit its own call sign
B No identification is required
C Both stations must transmit both call signs
D One of the stations must give both stations' call signs

B-001-013-005 **(B)**

What identification, if any, is required when two amateur radio stations end communications?

A Both stations must transmit both call signs
B Each station must transmit its own call sign
C No identification is required
D One of the stations must transmit both stations' call signs

B-001-013-006 **(C)**

What is the longest period of time an amateur radio station can transmit, without identifying by call sign?

A 15 minutes
B 10 minutes
C 30 minutes
D 20 minutes

B-001-013-007 **(C)**

When may an amateur radio operator transmit unidentified communications?

A Only if it does not interfere with others
B Only for two-way or third-party communications
C Only to control a model craft
D Only for brief tests not meant as messages

B-001-013-008 **(B)**

What language may you use when identifying your station?

A Any language of a country that is a member of the International Telecommunication Union
B English or French
C Any language being used for a contact
D Any language being used for a contact, providing Canada has a third-party communications agreement with that country

B-001-013-009 **(A)**

The call sign of an amateur radio station must be transmitted:

A at the beginning and at the end of each contact and at intervals not greater than 30 minutes

B at intervals not greater than three minutes when using voice communications

C at intervals not greater than ten minutes when using digital modes

D when requested to do so by the station being called

B-001-013-010 **(C)**

What are the station identification requirements for a test transmission?

A Identification shall be transmitted at five-minute intervals

B Identification is only needed on voice modes

C The rules are the same for a test or a radio contact

D Brief test transmissions need not be identified

B-001-013-011 **(B)**

The call sign of a Canadian amateur radio station would normally start with the letters:

A EA, EI, RO or UY

B VA, VE, VO or VY

C GA, GE, MO or VQ

D A, K, N or W

B-001-014-001 **(B)**

If a friend without amateur radio certification is using your station to talk to someone in Canada, and a foreign station breaks in to talk to your friend, what should you do?

A Stop all discussions and quickly sign off

B Continue monitoring the communications of your friend

C Take over the conversation with the Canadian and foreign station

D Instruct your friend to ignore the foreign station

B-001-014-002 **(D)**

In what circumstances can foreign amateur radio operators, other than United States citizens, operate while visiting Canada?

A Amateur radio operators are automatically granted equivalent privileges in all member states of the International Telecommunication Union

B Canada automatically grants privileges to visiting amateur radio operators

C The foreign amateur radio operator must submit an application to Radio Amateurs of Canada (RAC)

D Their country has an agreement with Canada and the amateur radio operator has obtained the appropriate permit

B-001-014-003 **(D)**

Canadian amateur radio operators may use their stations to transmit international communications on behalf of a third party:

A if the amateur radio station has received written authorization from Innovation, Science and Economic Development Canada

B when it is permitted by the foreign country

C when prior remuneration has been received

D because Canada does not prohibit international communications on behalf of third parties

B-001-014-004 **(A)**

What condition would preclude a Canadian amateur radio station from communicating with amateur radio stations in another country?

A The country has filed an objection to such communications with the International Telecommunication Union (ITU)

B It is prohibited by Innovation, Science and Economic Development Canada

C The country is not a member of the International Amateur Radio Union (IARU)

D The conversation is not conducted totally in English or French

B-001-014-005 **(A)**

Foreign amateur radio operators may operate in Canada if they qualify for a CEPT (European Conference of Postal and Telecommunications Administrations) Amateur Radio Licence. What operating privileges are they granted by Innovation, Science and Economic Development Canada?

A Advanced
B Basic with Honours
C Basic and Morse code
D Basic

B-001-014-006 **(B)**

Third-party communications are those conducted on behalf of a person without amateur radio certification. In the Canadian amateur radio service, what third-party communications are permissible?

A Only communications routed through a digital network
B Only communications of a personal and non-commercial nature
C Only communications where the third party is in a country approved by Innovation, Science and Economic Development Canada
D Only communications conducted entirely within Canada

B-001-014-007 **(C)**

International third-party amateur radio communication in case of emergencies or disaster relief is expressly permitted unless:

A the foreign administration is in a declared state of war
B internet service is working well in the foreign country involved
C specifically prohibited by the foreign administration concerned
D satellite communication can be originated in the disaster area

B-001-014-008 **(B)**

You and a foreign amateur radio operator both have a local friend without amateur radio certification engaged in radio communication. Who is considered a third party?

A The non-certified person at the Canadian station
B Both non-certified persons
C The foreign amateur radio operator and the other person at the foreign station
D The foreign amateur radio operator and both non-certified persons

B-001-014-009 **(A)**

While operating in Canada, what information must the holder of a United States-issued call sign indicate at least once during a contact?

A Location by city and province
B Current grid square
C Location and output power
D City and state of residence

B-001-014-010 **(A)**

While in Canada and operating in a voice mode, American amateur radio operators must identify with their call sign, the qualifier "mobile" or "portable" and what other information?

A The Canadian call sign prefix for the geographic location of the station
B The name of the nearest Canadian community
C The name of the province or territory where the station is located
D The transmitting frequency being used

B-001-014-011 **(B)**

Canadian amateur radio stations may provide communications on behalf of third parties:

A only in cases of emergencies or disaster relief
B with any other amateur radio station
C only with countries that have third-party traffic agreements with Canada
D on frequencies assigned to the Canadian Forces Affiliate Radio Service (CFARS)

B-001-015-001 **(A)**

If you let another amateur radio operator with additional qualifications than yours control your station and operate under your call sign, what operating privileges are allowed?

A Only the privileges allowed by your qualifications
B Any privileges allowed by the additional qualifications
C All the emission privileges of the additional qualifications, but only the frequency privileges of your qualifications
D All the frequency privileges of the additional qualifications, but only the emission privileges of your qualifications

B-001-015-002 **(D)**

If you are the control operator at the station of another amateur radio operator who has more certificate qualifications than you, what operating privileges are you allowed?

A Any privileges allowed by the additional qualifications
B All the emission privileges of the additional qualifications, but only the frequency privileges of your qualifications
C All the frequency privileges of the additional qualifications, but only the emission privileges of your qualifications
D Only the privileges allowed by your qualifications

B-001-015-003 **(A)**

In addition to passing the Basic written examination, what must you do before you are allowed to use amateur radio frequencies below 30 MHz?

A You must attain a mark of 80% on the Basic examination, or pass an Advanced or Morse code examination
B You must notify Innovation, Science and Economic Development Canada that you intend to operate on the HF bands
C You must pass a provincial communications examination
D You must attend a class to learn about HF communications

B-001-015-004 **(B)**

The holder of an Amateur Radio Operator Certificate may operate radio-controlled models:

A if only pulse modulation is used
B on all amateur radio bands above 30 MHz
C if the control transmitter does not exceed 15 kHz of occupied bandwidth
D on all amateur radio bands below 30 MHz

B-001-015-005 **(D)**

What is the frequency range of the 80-metre amateur radio band in Canada?

A 3.0 MHz to 3.5 MHz
B 4.0 MHz to 4.5 MHz
C 4.5 MHz to 5.0 MHz
D 3.5 MHz to 4.0 MHz

B-001-015-006 **(A)**

What is the frequency range of the 160-metre amateur radio band in Canada?

A 1.8 MHz to 2.0 MHz
B 1.5 MHz to 2.0 MHz
C 2.0 MHz to 2.25 MHz
D 2.25 MHz to 2.5 MHz

B-001-015-007 **(B)**

What is the frequency range of the 40-metre amateur radio band in Canada?

A 7.7 MHz to 8.0 MHz
B 7.0 MHz to 7.3 MHz
C 6.5 MHz to 6.8 MHz
D 6.0 MHz to 6.3 MHz

B-001-015-008 **(D)**

What is the frequency range of the 20-metre amateur radio band in Canada?

A 13.500 MHz to 14.000 MHz
B 15.000 MHz to 15.750 MHz
C 16.350 MHz to 16.830 MHz
D 14.000 MHz to 14.350 MHz

B-001-015-009 **(A)**

What is the frequency range of the 15-metre amateur radio band in Canada?

A 21.000 MHz to 21.450 MHz
B 18.068 MHz to 18.168 MHz
C 14.000 MHz to 14.350 MHz
D 28.000 MHz to 29.700 MHz

B-001-015-010 **(A)**

What is the frequency range of the 10-metre amateur radio band in Canada?

A 28.000 MHz to 29.700 MHz
B 24.890 MHz to 24.990 MHz
C 21.000 MHz to 21.450 MHz
D 50.000 MHz to 54.000 MHz

B-001-015-011 **(B)**

In Canada, which bands may amateur radio operators use for radio control of models?

A 50 MHz to 54 MHz, 144 MHz to 148 MHz, and 222 MHz to 225 MHz only
B All amateur radio bands above 30 MHz
C 50 MHz to 54 MHz only
D All amateur radio bands

B-001-016-001 **(C)**

What is the maximum authorized bandwidth on the 6-metre and 2-metre bands?

A 6 kHz
B 5 kHz
C 30 kHz
D 20 kHz

B-001-016-002 **(B)**

The maximum bandwidth of an amateur radio station's transmission allowed in the band 28 MHz to 29.7 MHz is:

A 15 kHz
B 20 kHz
C 6 kHz
D 30 kHz

B-001-016-003 **(D)**

Except for one band, what is the allowed bandwidth on amateur radio bands between 7 MHz and 25 MHz?

A 15 kHz
B 20 kHz
C 30 kHz
D 6 kHz

B-001-016-004 **(C)**

The maximum bandwidth of an amateur radio station's transmission allowed in the band 144 MHz to 148 MHz is:

A 20 kHz
B 15 kHz
C 30 kHz
D 6 kHz

B-001-016-005 **(B)**

The maximum bandwidth of an amateur radio station's transmission allowed in the band 50 MHz to 54 MHz is:

A 15 kHz
B 30 kHz
C 20 kHz
D 6 kHz

B-001-016-006 **(D)**

Which of the following amateur radio bands has a maximum allowed bandwidth of less than 6 kHz?

A 18.068 MHz to 18.168 MHz
B 24.890 MHz to 24.990 MHz
C 1.800 MHz to 2.000 MHz
D 10.100 MHz to 10.150 MHz

B-001-016-007 **(D)**

In which of the following amateur radio bands is single sideband prohibited?

A 18.068 MHz to 18.168 MHz
B 24.890 MHz to 24.990 MHz
C 7.000 MHz to 7.300 MHz
D 10.100 MHz to 10.150 MHz

B-001-016-008 **(D)**

What precaution must an amateur radio operator take when transmitting near band edges?

A Restrict operation to radiotelegraphy (CW) or digital modes
B Make sure that the emission mode is compatible with agreed band plans
C Reduce transmitter power
D Ensure that the entire occupied bandwidth falls within the amateur radio band

B-001-016-009 **(A)**

Based on the frequency stated and emission mode, which of the following combinations is prohibited?

A Fast-scan television (ATV) on 145 MHz
B FT8 on 14.074 MHz
C Morse radiotelegraphy (CW) on 10.145 MHz
D Fast-scan television (ATV) on 440 MHz

B-001-016-010 **(A)**

Based on the frequency stated and emission mode, which of the following combinations is prohibited?

A Fast-scan television (ATV) on 14.23 MHz
B Slow-scan television (SSTV) on 14.23 MHz
C Frequency modulation (FM) on 29.60 MHz
D Single sideband (SSB) on 3.76 MHz

B-001-016-011 **(B)**

Based on the frequency stated and emission mode, which of the following combinations is prohibited?

A FT8 on 10.136 MHz
B Single sideband (SSB) on 10.12 MHz
C Frequency modulation (FM) on 29.6 MHz
D Morse radiotelegraphy (CW) on 10.11 MHz

B-001-017-001 **(B)**

What transmitter power should Canadian amateur radio operators use at all times?

A 560 watts PEP output
B The minimum legal power necessary to communicate
C 400 watts PEP output
D 560 watts DC input

B-001-017-002 **(A)**

For single sideband (SSB) operation, what is the maximum transmitter peak envelope power (PEP) that an amateur radio station may use if the operator holds an Amateur Radio Operator Certificate with Advanced Qualification?

A 2250 watts
B 560 watts
C 250 watts
D 190 watts

B-001-017-003 **(B)**

You have determined the maximum transmitter power that meets RF exposure and radiated power limits. Where do you verify this power is NOT exceeded?

A At the antenna tuner output
B At the output of the transmitter or external amplifier
C At the antenna feed point
D At the power supply terminals

B-001-017-004 **(C)**

For SSB operation on 3750 kHz, what is the maximum transmitter peak envelope power (PEP) that an amateur radio station may use if the operator holds an Amateur Radio Operator Certificate with Basic and Morse code qualifications?

A 1500 watts
B 2250 watts
C 560 watts
D 1000 watts

B-001-017-005 **(C)**

For SSB operation on 7055 kHz, what is the maximum transmitter peak envelope power (PEP) that an amateur radio station may use if the operator holds an Amateur Radio Operator Certificate with Basic Qualification with Honours?

A 2250 watts
B 200 watts
C 560 watts
D 1000 watts

B-001-017-006 **(A)**

What is the maximum effective radiated power (ERP), expressed as peak envelope power (PEP), the holder of an Amateur Radio Operator Certificate with Advanced Qualification may use on 60 metres?

A 100 watts
B 250 watts
C 560 watts
D 2250 watts

B-001-017-007 **(B)**

What is the maximum allowed DC input power to the final RF stage of an amateur radio transmitter when the operator holds an Amateur Radio Operator Certificate with Advanced Qualification?

A 560 watts
B 1000 watts
C 250 watts
D 1500 watts

B-001-017-008 **(C)**

On 630 metres and 2200 metres, what key antenna characteristic must be taken into account to comply with power limitations expressed as equivalent isotropically radiated power (EIRP)?

A Impedance
B Resonance
C Gain
D Bandwidth

B-001-017-009 **(A)**

What maximum DC input power to the transmitter final amplifier stage, may be used by the holder of an Amateur Radio Operator Certificate with Basic Qualification?

A 250 watts
B 1000 watts
C 750 watts
D 560 watts

B-001-017-010 **(D)**

Unless an operator holds an Amateur Radio Operator Certificate with Advanced Qualification, what is the maximum carrier power that an amateur radio station may use on emissions other than SSB?

A 250 watts
B 560 watts
C 750 watts
D 190 watts

B-001-018-001 **(A)**

What kind of amateur radio station automatically retransmits the signals of other stations?

A Repeater station
B Satellite control station
C Remote-control station
D Beacon station

B-001-018-002 **(B)**

An unmodulated carrier may be transmitted only:

A for holding a frequency until a net begins
B for brief tests on frequencies below 30 MHz
C if the final RF amplifier output is kept under 5 watts
D for CW communication

B-001-018-003 **(C)**

What is the lowest output frequency of the repeaters that holders of an Amateur Radio Operator Certificate with only a Basic Qualification are allowed to use?

A 50 MHz
B 144 MHz
C 29.500 MHz
D 29.700 MHz

B-001-018-004 **(B)**

What is the lowest output frequency band segment of the repeaters that holders of an Amateur Radio Operator Certificate with only a Basic Qualification are allowed to use?

A 145 MHz to 148 MHz
B 29.500 MHz to 29.700 MHz
C 28.000 MHz to 29.700 MHz
D 53 MHz to 54 MHz

B-001-019-001 **(C)**

What do Canadian regulations stipulate regarding frequency stability in the amateur radio service?

A It must not drift more than 10 Hz from a governmental time signal broadcast service
B It shall remain within 0.05% from -30 to +40 degrees Celsius ambient temperature
C It must be equivalent to crystal control below 148 MHz
D It shall remain within 2 parts per million, one hour after power up

B-001-019-002 **(D)**

Which of the following emission modes requires that an amateur radio station have means to prevent or indicate overmodulation?

A CW
B RTTY
C FM
D SSB

B-001-019-003 **(C)**

Amateur radio stations are required to have means of indicating or preventing a signal quality problem unique to voice transmissions. What is it?

A Inadequate pre-emphasis
B Inadequate audio filtering
C Overmodulation
D Excessive compression

B-001-019-004 **(C)**

What is the maximum percentage of modulation permitted for amateur radio voice communications?

A 50%
B 90%
C 100%
D 75%

B-001-019-005 **(D)**

What must all amateur radio stations be capable of reliably measuring, regardless of emission mode?

A RF power
B SWR
C Modulation
D Frequency

B-001-019-006 **(B)**

What is the maximum percentage of modulation permitted for amateur radio voice communications?

A 50%
B 100%
C 90%
D 75%

B-001-020-001 **(C)**

What types of messages may be transmitted to an amateur radio station in a foreign country?

A Messages that are not religious, political, or patriotic in nature
B Messages of any type
C Messages related to the purposes of amateur radio or remarks of a personal nature
D Messages of any type, if the foreign country allows third-party communications with Canada

B-001-020-002 **(A)**

The amateur radio station operator shall ensure that:

A international communications are limited to the purposes of amateur radio or remarks of a personal nature
B commercial communications are brief
C international communications are carried out within the power limitations of the foreign administration
D third parties are charged a nominal sum for their messages

B-001-020-003 **(C)**

Which of the following is a provision of the International Telecommunication Union's Radio Regulations that applies to Canadian amateur radio operators?

A Radiocommunications between certified amateur radio operators are always permitted even if a country objects

B Amateur radio operators may recover reasonable costs from transmitting third-party messages

C International communications are permitted unless an administration has registered an objection

D Certification requirements in the amateur radio service are prescribed in the Radio Regulations

B-001-020-004 **(C)**

What do the International Telecommunication Union's Radio Regulations prescribe regarding proficiency in Morse code?

A Amateur radio operators must demonstrate proficiency in Morse code before using it on international communications

B Current regulations make no reference to proficiency in Morse code

C Administrations determine if proficiency in Morse code is a requirement for authorization

D Administrations shall not make proficiency in Morse code a requirement

B-001-020-005 **(A)**

Canadian amateur radio operators must comply with the Radiocommunication Act and Radiocommunication Regulations. What other organization issues radio regulations that Canadian amateur radio operators must comply with?

A International Telecommunication Union

B Provincial or territorial government communications department

C Radio Amateurs of Canada (RAC)

D International Amateur Radio Union

B-001-021-001 **(D)**

In which region of the International Telecommunication Union is Canada located?

A Region 4

B Region 3

C Region 1

D Region 2

B-001-021-002 **(D)**

A Canadian amateur radio operator, operating their station in the state of Florida, is subject to which frequency band limits?

A Those applicable in International Telecommunication Union region 2

B Those applicable in International Telecommunication Union region 3

C Those applicable in International Telecommunication Union region 1

D Those applicable to United States amateur radio operators

B-001-021-003 **(A)**

A Canadian amateur radio operator, operating their station 7 kilometres offshore from the coast of Florida, is subject to which frequency band limits?

A Those applicable to United States amateur radio operators

B Those applicable to Canadian amateur radio operators

C Those applicable in International Telecommunication Union region 1

D Those applicable in International Telecommunication Union region 2

B-001-021-004 **(B)**

In which region of the International Telecommunication Union are Australia, Japan, and Southeast Asia located?

A Region 4

B Region 3

C Region 1

D Region 2

B-001-021-005 **(C)**

In which region of the International Telecommunication Union are Europe and Africa located?

A Region 3
B Region 4
C Region 1
D Region 2

B-001-021-006 **(B)**

A CEPT (European Conference of Postal and Telecommunications Administrations) Amateur Radio Licence allows a qualified Canadian amateur radio operator to operate while visiting any participating country. What minimum level of qualification does a Canadian amateur radio operator need?

A Basic
B Advanced
C Basic with Honours
D Basic with Morse code

B-001-021-007 **(C)**

A Canadian amateur radio operator with a CEPT (European Conference of Postal and Telecommunications Administrations) Amateur Radio Licence operates in a participating country using a voice mode. What form of identification is required?

A Transmit their Canadian call sign
B Transmit their Canadian call sign, followed by "stroke," followed by the name of the country being visited
C Transmit the visited country's prefix, followed by "stroke," followed by their Canadian call sign
D Transmit their Canadian call sign, followed by "stroke," followed by the visited country's prefix

B-001-021-008 **(B)**

What minimum level of qualification does a Canadian amateur radio operator need to operate in the United States?

A Advanced
B Basic
C Basic with Honours
D Basic with Morse code

B-001-021-009 **(B)**

A Canadian amateur radio operator is operating in the United States using voice. What form of identification is required?

A Transmit their Canadian call sign, followed by the city and state where they are visiting
B Transmit their Canadian call sign, followed by "portable" or "mobile" as appropriate, followed by the prefix for the US call area being visited
C Transmit the prefix for the US call area being visited, followed by "portable" or "mobile" as appropriate, followed by their Canadian call sign
D Transmit their Canadian call sign

B-001-022-001 **(B)**

Which of these statements is NOT correct?

A There are no fees for taking an examination for an Amateur Radio Operator Certificate at an Innovation, Science and Economic Development Canada office
B The fee for taking an examination for an Amateur Radio Operator Certificate at an Innovation, Science and Economic Development Canada office is $5 per qualification
C An accredited examiner may recover the cost of administering an examination
D An accredited examiner must hold an Amateur Radio Operator Certificate with Basic, Advanced, and Morse code qualifications

B-001-022-002 **(A)**

Which of the following statements is NOT correct?

A A disabled candidate may be exempted from portions of an Amateur Radio Operator Certificate examination
B A disabled candidate, taking a Morse code sending test, may be allowed to recite the examination text in Morse code sounds
C Examinations for disabled candidates may be given orally, or tailored to the candidate's ability to complete the examination
D After passing the basic exam, a disabled candidate may take the other exams in any order

B-001-022-003 **(A)**

What is the fee for taking an examination for an Amateur Radio Operator Certificate, administered by an accredited examiner?

A The examiner may charge a fee to recover costs
B $20 per qualification
C No fee may be charged
D $20 per examination sitting

B-001-022-004 **(B)**

What is the fee for taking Amateur Radio Operator Certificate examinations at an Innovation, Science and Economic Development Canada office?

A $5 per qualification examination
B No charge for qualification examinations
C $20 per visit, regardless of the number of qualification examinations
D $20 per qualification

B-001-022-005 **(D)**

Which of the following statements is NOT correct?

A A candidate who fails a written examination for lack of reading skills may be given an oral examination
B A candidate who fails a written examination due to not usually speaking English or French may be given an oral examination
C An examiner may request medical evidence from a practising medical physician before accommodating testing
D A candidate with insufficient knowledge of English or French may be accompanied by an interpreter

B-001-023-001 **(D)**

Which of these statements about the installation or modification of an antenna structure is NOT correct?

A An amateur radio operator must follow Innovation, Science and Economic Development Canada's antenna siting procedures
B Innovation, Science and Economic Development Canada expects amateur radio operators to address community concerns in a responsible manner
C Prior to an installation, for which community concerns could be raised, amateur radio operators may be required to consult with their land-use authority
D An amateur radio operator may erect any size antenna structure without consulting neighbours or the local land-use authority

B-001-023-002 **(C)**

Who has authority over antenna installations, including antenna masts and towers?

A The local municipal government
B The majority of neighbours within a distance of three times the proposed antenna height
C The Minister of Innovation, Science and Industry
D The provincial or territorial Minister of Infrastructure

B-001-023-003 **(B)**

When may you NOT be required to contact land-use authorities to determine public consultation requirements for an antenna system?

A When transmitting will only be done at low power
B When an exclusion criterion defined by Innovation, Science and Economic Development Canada applies
C In a rural area
D When the structure is part of an amateur radio antenna

B-001-023-004 **(D)**

If an amateur radio operator wants to install or modify an antenna system and the local land-use authority has no approval process, what must the amateur radio operator do?

A Proceed without public consultation

B Develop their own public consultation process

C Wait for the land-use authority to develop its own public consultation process

D Follow the default public consultation process outlined by Innovation, Science and Economic Development Canada

B-001-023-005 **(C)**

Which is NOT an element of the Innovation, Science and Economic Development Canada public consultation process for antenna systems?

A Addressing relevant questions, comments and concerns

B Providing an opportunity for the public to respond regarding measures to address reasonable and relevant concerns

C Participating in public meetings on the project

D Providing written notice

B-001-023-006 **(D)**

Innovation, Science and Economic Development Canada's default public consultation process for antenna systems requires proponents to address:

A all questions, comments and concerns raised

B comments reported in the media

C opposition to the project

D reasonable and relevant concerns provided in writing within the 30-day public comment period

B-001-023-007 **(A)**

In a municipality with a public consultation process for antenna systems, when might public consultation NOT be required?

A The system is excluded by the municipal process OR the provisions of Client Procedures Circular CPC-2-0-03

B The system is excluded by the provisions of Client Procedures Circular CPC-2-0-03

C The system is excluded by the municipal process

D The system is excluded by the municipal process AND the provisions of Client Procedures Circular CPC-2-0-03

B-001-023-008 **(B)**

The proponent of an antenna system and a stakeholder, other than the general public, have failed to reach an agreement. How is a final decision reached?

A The decision is made by a majority vote of residents within a radius of three times the antenna height

B The decision is made by Innovation, Science and Economic Development Canada

C The decision is postponed until an agreement is reached

D The decision is made by the local municipality

B-001-023-009 **(C)**

Ignoring other requirements regarding the installation or modification of an antenna system, what is the tallest antenna structure you could erect without public consultation?

A 15 metres

B 21 metres

C The tallest exempted by the land-use authority or Innovation, Science and Economic Development Canada

D 10 metres

B-001-023-010 **(B)**

Where a land-use authority or municipality has established a public consultation process for antenna systems, who determines how public consultation should take place?

A The provincial government
B The municipality or local land-use authority
C Innovation, Science and Economic Development Canada
D The person planning to erect an antenna structure

B-001-024-001 **(D)**

What organization has published safety guidelines for the maximum limits of RF energy near the human body?

A Canadian Standards Association
B Environment Canada
C National Research Council
D Health Canada

B-001-024-002 **(A)**

What is the purpose of Safety Code 6?

A It gives RF exposure limits for the human body
B It lists all RF frequency allocations for interference protection
C It sets transmitter power limits for interference protection
D It sets antenna height limits for aircraft protection

B-001-024-003 **(D)**

According to Safety Code 6, what frequencies cause us the greatest risk from RF energy?

A 300 MHz to 3000 MHz
B Above 1500 MHz
C 3 MHz to 30 MHz
D 48 MHz to 300 MHz

B-001-024-004 **(B)**

Why is the limit of exposure to RF the lowest in the frequency range of 48 MHz to 300 MHz, according to Safety Code 6?

A Most transmissions in this range are for a longer time
B The human body absorbs RF energy the most in this range
C There are more transmitters operating in this range
D There are fewer transmitters operating in this range

B-001-024-005 **(C)**

According to Safety Code 6, what is the maximum safe power output to the antenna of a hand-held VHF or UHF radio?

A 7 watts
B 8 watts
C Not specified
D 5 watts

B-001-024-006 **(B)**

When specifying maximum levels of exposure to RF fields, which two basic situations does Safety Code 6 cover?

A Commercial and private transmitters
B Controlled and uncontrolled environments
C Fixed and portable transmitters
D Transmitters below 30 MHz and above 30 MHz

B-001-024-007 **(B)**

Apart from energy absorption and especially below 10 MHz, what is the second established adverse health effect described in Safety Code 6?

A Skin redness
B Nerve stimulation
C Nausea
D Numbness

B-001-024-008 **(C)**

Which statement is NOT correct?

A Safety Code 6 uses different units for magnetic field strength and electric field strength

B Safety Code 6 specifies lower exposure limits for the general public in uncontrolled areas than for controlled areas

C Hand-held transmitters are excluded from Safety Code 6 requirements

D Antenna gain, distance, transmitter power and frequency all influence exposure to radio energy

B-001-024-009 **(D)**

Safety Code 6 sets limits for RF exposure from radio transmitters. Which types of transmitters are exempt from regulation?

A Broadcast transmitters

B Portable transmitters

C Low power transmitters (less than 10 watts)

D No transmitters are exempt

B-001-024-010 **(C)**

Which of these statements about Safety Code 6 is NOT correct?

A Safety Code 6 sets limits for induced currents, electrical field strength and magnetic field strength from electromagnetic radiation

B Safety Code 6 sets limits for allowable rates at which RF energy is absorbed in the body (specific absorption rate)

C Safety Code 6 sets limits in terms of power levels fed into antennas

D Safety Code 6 sets limits for contact currents that could be drawn from ungrounded or poorly grounded objects

B-001-025-001 **(D)**

Your neighbour's stereo system malfunctions when you are transmitting. What provision in Electromagnetic Compatibility Advisory Bulletin EMCAB-2 deems the stereo system's lack of immunity is the cause?

A You are transmitting at or below your maximum permitted power

B The malfunction stops when you stop transmitting

C The field strength of your emissions, on your neighbour's premises, is above Innovation, Science and Economic Development Canada's specified immunity criteria

D The field strength of your emissions, on your neighbour's premises, is below Innovation, Science and Economic Development Canada's specified immunity criteria

B-001-025-002 **(A)**

Your neighbour's television receiver malfunctions when you are transmitting. What provision in Electromagnetic Compatibility Advisory Bulletin EMCAB-2 deems your transmission is the cause?

A The field strength of your emissions, on your neighbour's premises, is above Innovation, Science and Economic Development Canada's specified immunity criteria

B You are transmitting at or below your maximum permitted power

C The malfunction continues when you stop transmitting

D The field strength of your emissions, on your neighbour's premises, is below Innovation, Science and Economic Development Canada's specified immunity criteria

B-001-025-003 **(C)**

When determining the field strength criterion per Electromagnetic Compatibility Advisory Bulletin EMCAB-2, what type of equipment describes devices often used in home entertainment systems, but not strictly speaking radio apparatus?

A Radio-sensitive equipment

B Low-immunity equipment

C Associated equipment

D Broadcast receivers

B-001-025-004 **(A)**

Your neighbour complains that your transmissions interfere with their garage door opener. When determining the applicable field strength criterion in Electromagnetic Compatibility Advisory Bulletin EMCAB-2, what type of equipment is the garage door opener?

A Radio-sensitive equipment
B Associated equipment
C Broadcast equipment
D Low-immunity equipment

B-002-001-001 **(B)**

What is an appropriate way to make contact on a repeater?

A Say the call sign of the station you want to contact three times
B Say the call sign of the station you want to contact, then your call sign
C Say the other operator's name, then your call sign three times
D Say, "breaker, breaker"

B-002-001-002 **(B)**

What is the main purpose of a repeater?

A To make local information available 24 hours a day
B To increase the range of portable and mobile stations
C To link amateur radio stations with the telephone system
D To retransmit weather information during severe storm warnings

B-002-001-003 **(A)**

What is frequency coordination on VHF and UHF bands?

A A process which seeks to carefully recommend frequencies to minimize interference with neighbouring repeaters
B A band plan detailing modes and frequency segments within a band
C The selection of simplex frequencies used by individual operators
D A part of the planning prior to a contest

B-002-001-004 **(A)**

What is the purpose of a repeater time-out timer?

A It interrupts lengthy transmissions
B It hands over control to each user in turns
C It logs repeater transmit time to predict when a repeater will fail
D It tells how long someone has been using a repeater

B-002-001-005 **(A)**

What is a CTCSS tone?

A A sub-audible tone that activates a receiver audio output when present
B A tone used by repeaters to mark the end of a transmission
C A signal used for telemetry by amateur radio satellites
D A signal used for radio control of model craft

B-002-001-006 **(C)**

How do you call another station on a repeater if you know the station's call sign?

A Say "CQ" three times, then say the station's call sign
B Wait for the station to call "CQ," then answer it
C Say the station's call sign, then identify your own station
D Say "break, break," then say the station's call sign

B-002-001-007 **(A)**

Why should you pause before and between transmissions when using a repeater?

A To listen for anyone else wanting to use the repeater
B To check the SWR of the repeater
C To reach for pencil and paper for third-party communications
D To give the repeater time to respond

B-002-001-008 **(A)**

Why should you keep transmissions short when using a repeater?

A A long transmission may prevent someone with an emergency from using the repeater
B To keep long-distance charges down
C To reduce the bandwidth used by the repeater
D To avoid exceeding the repeater's memory storage

B-002-001-009 **(D)**

What is the proper way to join a conversation on a repeater?

A Wait for the end of a transmission and start calling the desired party
B Shout "break, break!" to show that you're eager to join the conversation
C Increase power to override whoever is talking
D Say your call sign during a break between transmissions

B-002-001-010 **(A)**

What is the accepted way to ask someone about their location when using a repeater?

A Where are you?
B What is your 10-20?
C Locations are not normally broadcast over the radio
D What is your 10-85?

B-002-001-011 **(B)**

FM repeater operation on the 2-metre band uses one frequency for transmission and one for reception. What is the standard difference between the transmit and receive frequencies (known as "offset")?

A 400 kHz
B 600 kHz
C 800 kHz
D 1000 kHz

B-002-002-001 **(D)**

To make your call sign better understood when using voice transmissions, what should you do?

A Use any words which start with the same letters as your call sign for each letter of your call
B Talk louder and faster
C Turn up your microphone gain
D Use International Telecommunication Union phonetic alphabet code words to spell letters in your call sign

B-002-002-002 **(A)**

What can you use as an aid for correct station identification when using voice?

A The International Telecommunication Union phonetic alphabet
B Q codes
C Unique words of your choice
D A speech compressor

B-002-002-003 **(A)**

In the International Telecommunication Union phonetic alphabet, what is the code word for the letter A?

A Alfa
B Able
C Adam
D America

B-002-002-004 **(B)**

In the International Telecommunication Union phonetic alphabet, what is the code word for the letter B?

A Baker
B Bravo
C Brazil
D Borneo

B-002-002-005 **(B)**

In the International Telecommunication Union phonetic alphabet, what is the code word for the letter D?

A David
B Delta
C Dog
D Denmark

B-002-002-006 **(B)**

In the International Telecommunication Union phonetic alphabet, what is the code word for the letter E?

A England
B Echo
C Easy
D Edward

B-002-002-007 **(A)**

In the International Telecommunication Union phonetic alphabet, what is the code word for the letter G?

A Golf
B George
C Germany
D Gibraltar

B-002-002-008 **(B)**

In the International Telecommunication Union phonetic alphabet, what is the code word for the letter I?

A Item
B India
C Iran
D Italy

B-002-002-009 **(D)**

In the International Telecommunication Union phonetic alphabet, what is the code word for the letter L?

A Love
B London
C Luxembourg
D Lima

B-002-002-010 **(B)**

In the International Telecommunication Union phonetic alphabet, what is the code word for the letter P?

A Peter
B Papa
C Portugal
D Paris

B-002-002-011 **(D)**

In the International Telecommunication Union phonetic alphabet, what is the code word for the letter R?

A Roger
B Radio
C Romania
D Romeo

B-002-003-001 **(B)**

What is the correct way to call "CQ" when using voice?

A Say "CQ" at least ten times, followed by "this is," followed by your call sign spoken once
B Say "CQ" three times, followed by "this is," followed by your call sign spoken three times
C Say "CQ" once, followed by "this is," followed by your call sign spoken three times
D Say "CQ" at least five times, followed by "this is," followed by your call sign spoken once

B-002-003-002 **(B)**

How should you answer a voice CQ call?

A Say your call sign twice, followed by "calling," then the other station's call sign
B Say the other station's call sign once, followed by "this is," then your call sign
C Say the other station's call sign at least five times, followed by "this is," then your call sign twice
D Say the other station's call sign at least three times, followed by "this is," and your call sign at least five times

B-002-003-003 **(A)**

What is simplex operation?

A Transmitting and receiving on the same frequency
B Transmitting and receiving over a wide area
C Transmitting on one frequency and receiving on another
D Transmitting one-way communications

B-002-003-004 **(A)**

When should you consider using simplex operation instead of a repeater?

A When signals are reliable between communicating parties without using a repeater
B When the most reliable communications are needed
C When an emergency telephone call is needed
D When you are travelling and need some local information

B-002-003-005 **(A)**

Why should local communications use VHF and UHF frequencies instead of HF frequencies?

A To minimize clutter on HF bands more appropriate for long-distance communication
B Because greater output power is permitted on VHF and UHF
C Because HF transmissions are not propagated locally
D Because signals are stronger on VHF and UHF frequencies

B-002-003-006 **(C)**

Why should you be careful in choosing a simplex frequency when operating VHF or UHF?

A Implanted medical devices share the same spectrum
B Some frequencies are designated for narrow band FM and others for wideband FM
C To avoid inadvertently choosing a frequency that is the input to a local repeater
D Some frequencies cannot accommodate simplex operation

B-002-003-007 **(D)**

If you are talking to a station using a repeater, how would you find out if you could communicate using simplex instead?

A By asking a third station to confirm it receives you both
B By checking if you can clearly receive a more distant repeater
C By asking the other station to move 10 kHz away to test the path
D By checking if you can clearly receive the station on the repeater's input frequency

B-002-003-008 **(B)**

If you are operating simplex on a repeater frequency, why would it be good practice to change to another frequency?

A Because changing the repeater's frequency requires the authorization of Innovation, Science and Economic Development Canada
B Because you may interfere with users of the repeater
C Because the repeater's output power may overload your receiver
D Because there are more repeater operators than simplex operators

B-002-003-009 **(B)**

Which sideband is commonly used for 20-metre voice operation?

A Double
B Upper
C Lower
D Independent

B-002-003-010 **(C)**

Which sideband is commonly used on 3755 kHz for voice operation?

A Double
B Upper
C Lower
D Independent

B-002-003-011 **(D)**

When calling a specific station on voice, what is the preferred format for your transmission?

A "CQ, CQ, CQ" followed by the call sign of the desired station
B Your call sign, followed by "calling" and the call sign of the desired station
C Your call sign repeated twice, the word "for" and the call sign of the desired station
D The call sign of the desired station, followed by "this is" and your call sign

B-002-004-001 **(C)**

What should you do before you transmit on any frequency?

A Make sure the SWR on your transmission line is high enough
B Increase power to ensure someone will hear you
C Listen to make sure others are not using the frequency
D Check your antenna for resonance at the selected frequency

B-002-004-002 **(A)**

If you contact another station and your signal is extremely strong and perfectly readable, what adjustment should you make to your transmitter?

A Turn down your power output to the minimum necessary
B Turn on your speech processor
C Bypass your antenna tuner
D None, continue with your contact

B-002-004-003 **(C)**

You need to transmit to adjust your antenna tuner prior to joining an HF single-sideband net that is in progress. On what frequency should you make the adjustment?

A On the net frequency
B On the band's centre frequency
C 3 kHz to 5 kHz away from the net frequency
D 1 kHz away from the net frequency

B-002-004-004 **(B)**

How can on-the-air interference be minimized during lengthy transmitter testing?

A Use a resonant antenna
B Use a dummy load
C Choose an unoccupied frequency
D Use a non-resonant antenna

B-002-004-005 **(A)**

Why would you use a dummy load?

A To test or adjust your transceiver without causing interference
B To give comparative signal reports
C It is faster to tune
D To reduce output power

B-002-004-006 **(B)**

If you are the net control station of a daily HF net, what should you do if the frequency on which you normally meet is in use just before the net begins?

A Cancel the net for that day
B Ask occupants if they would change frequency, otherwise move to a clear frequency
C Reduce your output power and start the net as usual
D Increase your power output so that net participants will be able to hear you over the existing activity

B-002-004-007 **(B)**

If a net is about to begin on a frequency that you and another station are using, what should you do?

A Turn off your radio
B As a courtesy, move to a different frequency
C Increase your power output to ensure that all net participants can hear you
D Transmit as long as possible on the frequency so that no other stations may use it

B-002-004-008 **(C)**

If propagation changes during your contact and you notice increasing interference from other stations on the same frequency, what should you do?

A Report the interference to your Section Manager at Radio Amateurs of Canada (RAC)
B Increase your output power
C Move to another frequency
D Tell the interfering stations to change frequency, since you were there first

B-002-004-009 **(D)**

When selecting a single-sideband voice transmitting frequency, what minimum frequency separation from a contact in progress should you allow to minimize interference?

A 150 Hz to 500 Hz
B Approximately 6 kHz
C Approximately 10 kHz
D Approximately 3 kHz

B-002-004-010 **(C)**

What is a band plan?

A A plan devised by a club for the effective use of a frequency band during a contest
B A schedule of additional band allocations for recommendation to the International Telecommunication Union
C A voluntary division of an amateur radio band to avoid interference between incompatible modes
D A schedule of operating restrictions within a band prescribed by Innovation, Science and Economic Development Canada

B-002-004-011 **(D)**

Before transmitting, the first thing you should do is:

A ask if the frequency is occupied
B make an announcement on the frequency indicating that you intend to make a call
C decrease your receiver's volume
D listen carefully so as not to interrupt communications already in progress

B-002-005-001 **(A)**

What is the correct way to call "CQ" when using Morse code?

A Send the letters "CQ" three times, followed by the word "DE," followed by your call sign three times
B Send the letters "CQ" three times, followed by the word "DE," followed by your call sign once
C Send the letters "CQ" ten times, followed by the word "DE," followed by your call sign once
D Send the letters "CQ" until someone answers

B-002-005-002 **(B)**

How should you answer a routine Morse code "CQ" call?

A Send your call sign followed by your name, station location and a signal report
B Send the other station's call sign twice, followed by the word "DE," followed by your call sign twice
C Send your call sign four times
D Send the other station's call sign once, followed by the word "DE," followed by your call sign four times

B-002-005-003 **(A)**

At what speed should a Morse code "CQ" call be transmitted?

A At any speed which you can reliably receive
B At the customary speed for the band
C At the highest speed your keyer will operate
D At the highest speed at which you can control the keyer

B-002-005-004 **(C)**

What is the meaning of "CQ"?

A An antenna is being tested
B The frequency is in use
C Calling any station
D Call on the quarter-hour

B-002-005-005 **(C)**

What is the meaning of the word "DE" in Morse code?

A Calling any station
B Directional Emissions
C From
D Received all correctly

B-002-005-006 **(B)**

What is the meaning of the Morse code signal "K"?

A All received correctly
B Any station please reply
C End of message
D Called station only reply

B-002-005-007 **(D)**

What is meant by the term "DX"?

A Calling any station
B Go ahead
C Best regards
D Distant station

B-002-005-008 **(D)**

What is the meaning of the term "73"?

A Long distance
B Love and kisses
C Go ahead
D Best regards

B-002-005-009 **(C)**

Which of the following describes full break-in CW (QSK)?

A An operator must activate a manual send/receive switch before and after every transmission
B Stations wishing to break in must send the Morse code signal "BK"
C Incoming signals are received between transmitted dots and dashes
D Automatic keyers are used instead of hand keys

B-002-005-010 **(A)**

When selecting a CW transmitting frequency, what minimum frequency separation from a contact in progress should you allow to minimize interference?

A 150 Hz to 500 Hz
B 5 Hz to 50 Hz
C 1 kHz to 3 kHz
D 3 kHz to 6 kHz

B-002-005-011 **(C)**

What is the meaning of the Morse code signal "R"?

A Called station only reply
B Repeat all
C All received
D End of message

B-002-006-001 **(A)**

What do "RST" signal reports describe?

A Signal reception
B Transmitter power
C Sunspot activity
D Ionospheric conditions

B-002-006-002 **(A)**

What does "RST" stand for in a signal report?

A Readability, signal strength, tone
B Recovery, signal strength, tempo
C Recovery, signal speed, tone
D Readability, signal speed, tempo

B-002-006-003 **(B)**

What is the meaning of: "Your signal report is 5 7"?

A Your signal is perfectly readable, but weak
B Your signal is perfectly readable and moderately strong
C Your signal is readable with considerable difficulty
D Your signal is perfectly readable with near pure tone

B-002-006-004 **(A)**

What is the meaning of: "Your signal report is 3 3"?

A Your signal is readable with considerable difficulty and weak in strength
B Your signal is unreadable, very weak in strength
C The station is located at latitude 33 degrees
D The contact is serial number 33

B-002-006-005 **(B)**

What is the meaning of: "You are 5 9 plus 20 dB"?

A Your signal strength has increased by a factor of 100
B You are perfectly readable with a signal strength 20 decibels greater than S9
C The bandwidth of your signal is 20 decibels above linearity
D Repeat your transmission on a frequency 20 kHz higher

B-002-006-006 **(A)**

A distant station asks for a signal report on a local repeater you monitor. What do you report?

A The quality of the station's signal and audio as heard through the repeater
B Your S-meter reading on the repeater output frequency
C Your S-meter reading on the repeater input frequency
D The readability and strength of the repeater signal

B-002-006-007 **(D)**

Your receiver's S-meter is calibrated to a standard of 6 dB per S-unit per a recommendation by the International Amateur Radio Union (IARU). The S-meter shows S9 when receiving a station transmitting with 100 watts. Neglecting propagation changes, what transmitter power would cause your receiver's S-meter to read S8?

A 75 watts
B 50 watts
C 33 watts
D 25 watts

B-002-006-008 **(B)**

Assume your receiver's S-meter is calibrated to a standard of 6 dB per S-unit per a recommendation by the International Amateur Radio Union (IARU). The S-meter on your receiver shows S8 when listening to a nearby transmitter. Approximately how much must the transmitter power be raised to increase the reading to S9?

A 2 times
B 4 times
C 5 times
D 3 times

B-002-006-009 **(C)**

What does "RST 579" mean in a Morse code contact?

A Your signal is fairly readable, fair strength, and with perfect tone
B Your signal is barely readable, moderately strong, and with a faint ripple
C Your signal is perfectly readable, moderately strong, and with perfect tone
D Your signal is perfectly readable, weak strength, and with perfect tone

B-002-006-010 **(D)**

What does "RST 459" mean in a Morse code contact?

A Your signal is very readable, very strong, and with perfect tone
B Your signal is barely readable, very weak, and with perfect tone
C Your signal is moderately readable, very weak, and with hum on the tone
D Your signal is quite readable, fair strength, and with perfect tone

B-002-006-011 **(C)**

In voice contacts, what is the meaning of "Your signal report is 1 1"?

A Your signal is moderately readable with moderate strength
B Your signal is very readable and very strong
C Your signal is unreadable, and barely perceptible
D Your signal is 11 dB over S9

B-002-007-001 **(B)**

What does the code "QRS" mean in amateur radio?

A Radio station location is ...
B Send more slowly
C Interference from static
D Send "RST" report

B-002-007-002 **(A)**

What does the code "QTH" mean in amateur radio?

A My location is ...
B Stop sending
C My name is ...
D Time here is ...

B-002-007-003 **(C)**

What is the proper Q code to use to see if a frequency is in use before transmitting on CW?

A QRU?
B QRZ?
C QRL?
D QRV?

B-002-007-004 **(A)**

What does the code "QSY" mean in amateur radio?

A Change frequency
B Use more power
C Send faster
D Send more slowly

B-002-007-005 **(C)**

What does the code "QSB" mean in amateur radio?

A I have no message
B I am confirming contact
C Your signal is fading
D I am busy

B-002-007-006 **(B)**

What is the correct Q code to ask who is calling you?

A QRT?
B QRZ?
C QSL?
D QRL?

B-002-007-007 **(D)**

What does the code "QRM" mean in amateur radio?

A I am troubled by static
B Your signals are fading
C I am busy
D I am being interfered with

B-002-007-008 **(A)**

What does the code "QRN" mean in amateur radio?

A I am troubled by static
B I am busy
C I will call you
D I am being interfered with

B-002-007-009 **(B)**

What is the Q code indicating that you want the other station to send slower?

A QRN
B QRS
C QRM
D QRL

B-002-007-010 **(C)**

What is the Q code that means "Who is calling me?" in amateur radio?

A QRP?
B QRM?
C QRZ?
D QRK?

B-002-007-011 **(D)**

What is the Q code that means "I will call you again" in amateur radio?

A QRZ
B QRS
C QRT
D QRX

B-002-008-001 **(C)**

When may you use your amateur radio station to transmit an "SOS" or "MAYDAY"?

A Only at specific times (at 15 and 30 minutes after the hour)
B Only in case of a severe weather watch
C In a life-threatening distress situation
D Never

B-002-008-002 **(D)**

You need to summon help while stranded in a remote location, but without immediate risk to life. What priority is your message?

A Distress
B Safety
C Welfare
D Urgent

B-002-008-003 **(C)**

What voice signal, transmitted three times, signifies distress?

A EMERGENCY
B HELP
C MAYDAY
D SOS

B-002-008-004 **(C)**

What is the correct distress signal in Morse code?

A QRRR
B MAYDAY
C SOS
D CQD

B-002-008-005 **(A)**

What is the correct way to interrupt a repeater conversation to seek assistance in a distress situation?

A Break-in between transmissions to state your call sign and situation
B Say "EMERGENCY" three times
C Say "SOS," then your call sign
D Say "HELP" as many times as it takes to get someone to answer

B-002-008-006 **(C)**

What is the advantage of preparing to operate your station without commercial AC power?

A So you may operate in contests where AC power is not allowed
B So you may use your station while mobile
C So you may provide communications during a power outage
D So you will comply with the rules

B-002-008-007 **(B)**

In an emergency, what additional equipment is crucial to maintaining communications with a hand-held radio?

A A microphone headset for hands-free operation
B An adequate supply of charged batteries
C An extra antenna
D A portable amplifier

B-002-008-008 **(C)**

Which type of antenna would be a good choice as part of a portable HF station that could be set up in case of an emergency?

A A three-element Yagi
B A three-element quad
C A dipole or a vertical
D A parabolic dish

B-002-008-009 **(D)**

If you are communicating with another station and hear a station in distress break in, what should you do?

A Continue your communication because you were on frequency first
B Change to a different frequency so the station in distress may have a clear channel to call for assistance
C Immediately cease all transmissions because stations in distress have emergency rights to the frequency
D Acknowledge the station in distress and determine its location and what assistance may be needed

B-002-008-010 **(C)**

In order of priority, a distress message comes before:

A a government priority message
B a safety message
C an emergency message
D no other messages

B-002-008-011 **(B)**

If you hear distress traffic and are unable to render direct assistance you should:

A tell all other stations to cease transmitting
B contact authorities and maintain watch in case your assistance is needed
C enter the details in the logbook and take no further action
D take no action

B-002-009-001 **(B)**

What is a "QSL card"?

A A letter or postcard from an amateur radio operator
B A written proof of communication between two amateur radio operators
C A notice of an apparent infraction from Innovation, Science and Economic Development Canada
D A postcard reminding you when your certificate will expire

B-002-009-002 **(B)**

What is an azimuthal map?

A A map projection centred on the geographic North Pole
B A map projection centred on a given location
C A map projection displaying Maidenhead grid squares
D A map projection centred on the magnetic North Pole

B-002-009-003 **(B)**

While making a contact in a VHF contest, the other operator asks for your grid square. What information is requested?

A The elevation of your station in thirty-metre increments
B Your location expressed as a 4 or 6-character code
C Your antenna azimuth stated in compass degrees
D The number of contacts you have made

B-002-009-004 **(D)**

A directional antenna pointed in the long-path direction to another station is generally oriented how many degrees from its short-path heading?

A 45 degrees
B 90 degrees
C 270 degrees
D 180 degrees

B-002-009-005 **(C)**

What method is used by amateur radio operators to provide proof of communication with another station?

A A radiogram sent over amateur radio traffic nets
B A brief email or text message
C A QSL card or entries in web-based logging systems
D A letter detailing contact date, time, frequency, mode and power

B-002-009-006 **(A)**

Local stations are in contact with New Zealand, yet you cannot hear the New Zealand amateur radio operators with your antenna pointed in that direction. What other antenna direction could you try to hear them?

A Point your antenna 180 degrees from the current bearing
B Point your antenna 90 degrees west of the current bearing
C Point your antenna 90 degrees east of the current bearing
D Point your antenna further south

B-002-009-007 **(A)**

Which statement about recording all contacts and unanswered CQ calls in a paper or computer-based station logbook is NOT correct?

A A logbook is a regulatory requirement
B A logbook is important for recording contacts for operating awards
C A well-kept logbook preserves your fondest amateur radio memories for years
D A logbook is important for handling neighbour interference complaints

B-002-009-008 **(D)**

What is the most useful function of an azimuthal world map centred on your location?

A To allow computing the radiation angle to any location
B To associate distances with optimal ionospheric region
C To show the azimuth to meteor showers throughout the year
D To show the bearing to any location

B-002-009-009 **(B)**

Activity schedules, time entries in logbooks and contact confirmations usually refer to UTC (Coordinated Universal Time). What is the location of the meridian from which this time is measured?

A Boulder, United States of America
B Greenwich, United Kingdom
C Geneva, Switzerland
D Ottawa, Canada

B-002-009-010 **(C)**

Your time zone is UTC minus 6 hours. You want to join a net scheduled for 19:00 UTC. What is the local scheduled time?

A 7 PM
B 7 AM (tomorrow)
C 1 PM
D 1 AM (tomorrow)

B-002-009-011 **(A)**

What is the usefulness of stations CHU, WWV and WWVH to amateur radio operators?

A Provide accurate and precise frequency and time signals
B Provide received signal reports of your transmissions
C Provide forecasts of band conditions
D Provide amateur radio bulletins

B-003-001-001 **(A)**

To be most effective, where should a low-pass filter be connected in an HF station without an external power amplifier?

A As close as possible to the transceiver output
B Between the SWR meter and the antenna tuner
C Between the antenna tuner and the antenna switch
D As close as possible to the antenna switch output

B-003-001-002 **(D)**

In an HF station that includes an external RF power amplifier, where should a low-pass filter be located?

A Between the SWR meter and the antenna tuner
B Between the antenna tuner and the antenna switch
C As close as possible to the transceiver output
D As close as possible to the external amplifier output

B-003-001-003 **(A)**

Why do modern HF transmitters have a built-in low-pass filter in their RF output circuits?

A To reduce harmonic emissions
B To reduce fundamental emission
C To reduce adjacent channel interference
D To reduce RF energy below a cut-off point

B-003-001-004 **(A)**

Which component in an HF station is used to determine if the antenna system impedance is matched to the transmitter?

A SWR meter
B Frequency meter
C Multimeter
D S-meter

B-003-001-005 **(D)**

What is the purpose of the antenna switch in an HF station?

A To adjust the antenna operating frequency
B To adjust the impedance of the antenna system
C To select the orientation of the antenna
D To select the desired antenna or dummy load

B-003-001-006 **(A)**

In an HF station, what device might allow the use of an antenna on a band it was not designed for?

A An antenna tuner
B A low-pass filter
C A high-pass filter
D An SWR meter

B-003-001-007 **(B)**

In an HF station, which component is designed to dissipate RF energy and prevent radiation?

A Heat sink
B Dummy load
C Lightning surge protector
D Low-pass filter

B-003-001-008 **(B)**

In an HF station, right after which component is the SWR meter inserted?

A The antenna switch
B The low-pass filter
C The last stage of RF amplification
D The antenna tuner

B-003-001-009 **(A)**

When using an HF transmitter with a solid-state final amplifier, which station component may need to be adjusted when changing frequency?

A Antenna tuner
B Low-pass filter
C SWR meter
D Dummy load

B-003-002-001 **(B)**

What does the microphone produce in an FM transmitter?

A A radio frequency signal driving the power amplifier
B An electrical signal driving the speech amplifier
C An electrical signal driving the oscillator
D A radio frequency signal driving the speech amplifier

B-003-002-002 **(C)**

The microphone of an FM transmitter:

A has a different tone than other microphones
B has a wider frequency range than other microphones
C produces an electrical signal from air pressure changes
D is quieter than AM or SSB microphones

B-003-002-003 **(D)**

An FM transmitter's modulator:

A as no effect on the frequency of the oscillator
B alters the radio's output signal amplitude
C produces amplitude changes in the oscillator
D affects the frequency of the oscillator

B-003-002-004 **(A)**

How is the oscillator in the FM transmitter different from oscillators in AM, CW, and SSB transmitters?

A The modulator alters its frequency
B It runs at much higher frequencies
C It has higher fidelity
D The modulator changes its output amplitude

B-003-002-005 **(B)**

In an FM transmitter, the frequency multiplier:

A produces a low distortion audio response
B produces the FM output carrier frequency
C allows the oscillator to be run at very high frequencies
D is the major load fed by the power supply

B-003-002-006 **(C)**

In an FM transmitter, which stage produces a useful harmonic?

A Power amplifier
B Speech amplifier
C Frequency multiplier
D Modulator

B-003-002-007 **(D)**

In an FM transmitter, which stage draws the most electric power?

A Frequency multiplier
B Oscillator
C Speech amplifier
D Power amplifier

B-003-003-001 **(A)**

In a superheterodyne receiver, which stage is called the front-end?

A RF amplifier
B Local oscillator
C AF amplifier
D Limiter

B-003-003-002 **(C)**

In a VHF superheterodyne receiver, which stage must be designed to produce very little noise?

A IF amplifier
B Limiter
C RF amplifier
D Product detector

B-003-003-003 **(C)**

In a superheterodyne receiver, which stage allows detection to function at a single frequency regardless of the received frequency?

A IF filter
B Discriminator
C Mixer
D Limiter

B-003-003-004 **(D)**

In a superheterodyne receiver, which stage sets the received frequency?

A RF amplifier
B IF filter
C Beat frequency oscillator
D Local oscillator

B-003-003-005 **(B)**

In a superheterodyne receiver, which stage rejects signals on adjacent channels?

A Product detector
B IF filter
C Mixer
D Limiter

B-003-003-006 **(A)**

In a superheterodyne receiver, which stage provides the final signal power to drive the detector?

A IF amplifier
B RF amplifier
C Speech amplifier
D Frequency multiplier

B-003-003-007 **(D)**

In an FM receiver, what is the purpose of the limiter?

A Suppress local oscillator harmonics
B Prevent overdriving the IF amplifier
C Maintain constant input level to the mixer
D Remove amplitude variations from the received signal

B-003-003-008 **(B)**

In an FM receiver, what is the purpose of the discriminator?

A Provide most of the receiver's selectivity
B Recover the original modulation from the carrier
C Select narrowband or wideband FM reception
D Remove amplitude modulation from the received signal

B-003-003-009 **(C)**

In a receiver, which stage is controlled by the volume control?

A Discriminator
B IF amplifier
C AF amplifier
D Limiter

B-003-003-010 **(D)**

In an FM receiver, which stage includes a squelch circuit?

A Limiter
B IF amplifier
C Product detector
D AF amplifier

B-003-004-001 **(C)**

In a basic CW transmitter, the output from the oscillator is:

A at a submultiple of the operating frequency
B less stable than the transmitted signal
C at the transmitted signal's frequency
D at the transmitted signal's power level

B-003-004-002 **(C)**

In a basic CW transmitter, what type of electricity directly powers each stage?

A Audio frequency current
B Alternating current
C Direct current
D Radio frequency current

B-003-004-003 **(B)**

In a basic CW transmitter, why is the oscillator followed by a driver/buffer stage?

A To filter out spurious emissions from the oscillator
B To prevent load changes from shifting the oscillator's frequency
C To shape the oscillator waveform to prevent key clicks
D To filter out noise from the oscillator

B-003-004-004 **(B)**

In a basic three-stage CW transmitter, what does the key do?

A It reduces key chirps
B It controls the amplitude of the carrier
C It switches the oscillator on and off
D It reduces key clicks

B-003-004-005 **(B)**

In a basic CW transmitter, what does the power amplifier stage do?

A It reduces distortion in the transmitted signal
B It increases the transmitter's output power
C It removes CW chirps from the transmitted signal
D It multiplies the oscillator frequency to the operating frequency

B-003-004-006 **(C)**

In a basic CW transmitter, what does the key do?

A It switches the transmitted tone on and off
B It makes and breaks the antenna connection
C It switches the carrier on and off
D It switches the carrier between two frequencies

B-003-005-001 **(B)**

In an SSB/CW receiver, what is the purpose of the antenna?

A Separate signals from atmospheric noise
B Convert electromagnetic waves into electrical currents
C Protect the receiver from overload
D Polarize signals received via sky-wave propagation

B-003-005-002 **(C)**

In an SSB/CW receiver, what is the purpose of the radio frequency (RF) amplifier?

A Increase the local oscillator signal to drive the mixer
B Provide sufficient gain to activate the limiter circuit
C Increase the sensitivity of the receiver
D Provide sufficient drive for the automatic gain control circuit (AGC)

B-003-005-003 **(D)**

In an SSB/CW receiver, what is the purpose of the mixer?

A Convert the beat frequency oscillator signal to audio
B Provide USB and LSB signals for sideband selection
C Remove the carrier from the received signal
D Convert the received signal into the intermediate frequency

B-003-005-004 **(A)**

In an SSB/CW receiver, what is the purpose of the signal generated by the local oscillator?

A It is mixed with the incoming signal to produce the intermediate frequency
B It is mixed with the beat frequency oscillator signal to produce audio
C It is fed to the receiver input to provide band edge markers
D It is mixed with the intermediate frequency signal to produce a CW sidetone

B-003-005-005 **(C)**

In an SSB/CW receiver, what is the purpose of the intermediate frequency (IF) filter?

A Suppress spurious signals from the IF amplifier
B Reject RF from the product detector, passing only audio
C Provide most of the selectivity of the receiver
D For SSB reception, select the desired sideband

B-003-005-006 **(D)**

In an SSB/CW receiver, what is the purpose of the intermediate frequency (IF) amplifier?

A Boost the signal as required for the mixer
B Increase the level of the recovered modulation
C Provide sufficient gain to activate the limiter circuit
D Provide most of the receiver gain

B-003-005-007 **(D)**

In an SSB/CW receiver, what is the purpose of the product detector?

A For SSB reception, reject the unwanted sideband
B Convert audio frequency electrical signals into sound
C Detect frequency drift to control the local oscillator
D Recover the transmitted modulation

B-003-005-008 **(D)**

In an SSB/CW receiver, what is the purpose of the signal produced by the beat frequency oscillator (BFO)?

A It is mixed with the incoming signal to produce the intermediate frequency
B It drives the automatic gain control circuit to maintain a constant audio level
C It is fed to the receiver input to provide band edge markers
D It is mixed with the IF to recover the transmitted modulation

B-003-005-009 **(D)**

In an SSB/CW receiver, what is the purpose of the audio frequency (AF) amplifier?

A Convert audio frequency electrical signals into sound
B Increase the BFO signal for driving the product detector
C Provide audible warning of receiver overload
D Increase the level of the recovered modulation

B-003-005-010 **(A)**

In an SSB/CW receiver, which stage could include an audio band-pass filter?

A AF amplifier
B IF amplifier
C IF filter
D Limiter

B-003-006-001 **(D)**

In a single-sideband transmitter, what does the fixed RF oscillator do?

A It directly drives the sideband filter
B It drives the mixer
C It balances the variable frequency oscillator
D It produces an RF carrier

B-003-006-002 **(A)**

In a single-sideband transmitter, why is the speech amplifier needed?

A Microphones usually have a low power output
B To match the balanced modulator's output impedance
C The sideband filter requires a large audio signal to work
D To improve signal fidelity

B-003-006-003 **(D)**

In a typical single-sideband transmitter, what is the purpose of the filter that follows the balanced modulator?

A Suppress the RF carrier signal
B Shape the audio waveform
C Remove harmonics from the transmitted signal
D Remove the unwanted sideband

B-003-006-004 **(B)**

In a typical single-sideband transmitter, at what frequency is the sideband filter tuned?

A At audio frequencies
B Near the fixed RF oscillator frequency
C At the VFO frequency
D Near the operating frequency

B-003-006-005 **(D)**

In a single-sideband transmitter, what is the purpose of the speech amplifier?

A Amplify one of the signal's two sidebands
B Amplify the signal's carrier
C Amplify the signal's harmonic content
D Amplify the audio you wish to transmit

B-003-006-006 **(C)**

In a single-sideband transmitter, which stage transposes the single-sideband signal to the operating frequency?

A Balanced modulator
B Fixed RF oscillator
C Mixer
D Variable frequency oscillator

B-003-006-007 **(C)**

In a single-sideband transmitter, which stage allows you to adjust the final transmit frequency?

A Sideband filter
B Balanced modulator
C Variable frequency oscillator
D Antenna tuner

B-003-006-008 **(D)**

In a single-sideband transmitter, which stage normally includes a circuit providing protection from excessive SWR?

A Speech amplifier
B Variable frequency oscillator
C Balanced modulator
D Final amplifier

B-003-006-009 **(C)**

In a single-sideband transmitter, which stage transposes the voice message from the audio spectrum to the radio spectrum?

A Variable frequency oscillator
B Fixed RF oscillator
C Balanced modulator
D Mixer

B-003-007-001 **(C)**

Which of the following is a function of the sound card interface in a station operating computer-based digital modes?

A To amplify the digital signals to be sent by the transceiver
B To demodulate the transmitted signal
C To convert the received analog audio signal from the transceiver into a digital signal for the computer
D To convert the received digital signal from the transceiver into an analog signal for the computer

B-003-007-002 **(D)**

Which of the following is a function of the sound card interface in a station operating computer-based digital modes?

A To convert the analog signal from the computer into a digital signal that can be transmitted
B To amplify the digital signals to be sent by the transceiver
C To demodulate the transmitted signal
D To convert the digital signal from the computer into an audio signal that can be transmitted

B-003-007-003 **(D)**

Which of the following is one function of most sound card interfaces in a station operating computer-based digital modes?

A Display the transmit frequency
B Translate the digital signal into alphanumeric characters
C Modulate the received signal
D Switch the transceiver between receive and transmit modes

B-003-007-004 **(A)**

Which of the following is a function of the sound card interface in a station operating computer-based digital modes?

A To provide audio frequency coupling between a computer and a transceiver
B To provide radio frequency coupling between a computer and a transceiver
C To amplify the digital signals to be sent by the transceiver
D To demodulate the transmitted signal

B-003-007-005 **(A)**

Why are isolation transformers often included in the sound card interface of a station operating computer-based digital modes?

A To prevent the coupling of the transceiver and computer from introducing hum and interference into the transmitted signals
B To increase the signal voltage generated by the computer to the level required by the transceiver
C To match the impedance of the computer output signal to the impedance of the input of the computer
D To provide a source of DC power for the circuitry in the interface

B-003-007-006 **(B)**

Why are some transceivers capable of operating computer-based digital modes without a separate sound card?

A Because they support CAT (Computer Aided Transceiver)
B Because they incorporate an audio codec
C Because they provide a USB connector
D Because digital signal processing (DSP) is built-in

B-003-008-001 **(D)**

If a linear power supply provides overvoltage protection, where is the voltage monitored?

A At the output of the filter
B At the input of the rectifier
C At the input of the transformer
D At the output of the regulator

B-003-008-002 **(A)**

What is the purpose of the transformer in a linear power supply?

A Convert the AC mains voltage up or down as required and provide isolation
B Convert alternating current into direct current
C Smooth out the pulsating direct current
D Ensure that the voltage stays constant when a heavy demand is placed on the supply

B-003-008-003 **(D)**

What is the purpose of the rectifier in a linear power supply?

A Ensure that the voltage stays constant when a heavy demand is placed on the supply
B Convert the AC mains voltage up or down as required and provide isolation
C Smooth out pulsating direct current
D Convert alternating current into direct current

B-003-008-004 **(C)**

What is the purpose of the filter in a linear power supply?

A Ensure that the voltage stays constant when a heavy demand is placed on the supply
B Absorb the power produced by the supply
C Smooth out pulsating direct current
D Convert alternating current into direct current

B-003-008-005 **(B)**

What is the purpose of the regulator in a linear power supply?

A Absorb the power produced by the supply
B Ensure that the voltage stays constant when the demand on the supply varies
C Convert the AC mains voltage up or down as required and provides isolation
D Convert alternating current into direct current

B-003-008-006 **(A)**

In a linear power supply, which stage typically requires a heat sink?

A Voltage regulator
B Transformer
C Rectifier
D Filter

B-003-009-001 **(D)**

Which component of a 3-element Yagi antenna is primarily for mechanical support?

A The reflector
B The driven element
C The director
D The boom

B-003-009-002 **(C)**

In a 3-element Yagi antenna, what is the longest radiating element?

A The director
B The driven element
C The reflector
D The boom

B-003-009-003 **(B)**

In a 3-element Yagi antenna, which is the shortest radiating element?

A The driven element
B The director
C The reflector
D The boom

B-003-009-004 **(B)**

In a 3-element Yagi antenna, which element is connected to the transmission line?

A The director
B The driven element
C The reflector
D The boom

B-003-010-001 **(C)**

Which series of emission modes listed below is in order from the narrowest bandwidth to the widest bandwidth?

A FM voice, SSB voice and CW
B SSB voice, CW and FM voice
C CW, SSB voice and FM voice
D CW, FM voice and SSB voice

B-003-010-002 **(C)**

The figure in a receiver's specifications which indicates its sensitivity is the:

A bandwidth of the IF in kilohertz
B number of RF amplifiers
C RF input signal needed to achieve a given signal-to-noise ratio
D audio output in watts

B-003-010-003 **(D)**

What are the two signal parameters presented to the user on the waterfall display (spectrogram) of a modern receiver?

A Frequency and phase
B Phase and bandwidth
C Bandwidth and digital mode
D Amplitude and frequency

B-003-010-004 **(B)**

What is the function of automatic gain control (AGC) in a receiver?

A Maximize overall gain for greater sensitivity
B Limit the change in volume due to large signal strength variations
C Remove high-amplitude short-duration noise pulses
D Improve the signal-to-distortion ratio of the detector

B-003-010-005 **(C)**

For which of the following emission modes is it important for the receiver to be tuned accurately (within 100 Hz)?

A FM
B CW
C SSB
D AM

B-003-010-006 **(A)**

A superheterodyne receiver has an intermediate frequency (IF) of 455 kHz. The local oscillator runs above the operating frequency. To which frequency should it be tuned to receive a signal on 3.54 MHz?

A 3.995 MHz
B 4.450 MHz
C 4.905 MHz
D 13.540 MHz

B-003-010-007 **(B)**

When receiving a modulated signal, what is the adverse consequence of too narrow a receiver bandwidth?

A Lower signal-to-noise ratio
B Loss of information
C Loss of dynamic range
D Lower signal strength

B-003-010-008 **(D)**

Apart from sensitivity and selectivity, which of these is the third main indicator of communications receiver performance?

A Frequency range
B Fidelity
C Volume range
D Dynamic range

B-003-010-009 **(A)**

A communications receiver has four filters installed in it, respectively designated as 250 Hz, 500 Hz, 2.4 kHz, and 6 kHz. If you were listening to single sideband, which filter would you utilize?

A 2.4 kHz
B 250 Hz
C 6 kHz
D 500 Hz

B-003-010-010 **(B)**

A communications receiver has four filters installed in it, respectively designated as 250 Hz, 500 Hz, 2.4 kHz and 6 kHz. You are copying a CW transmission and there is a great deal of interference. Which one of the filters would you choose?

A 6 kHz
B 250 Hz
C 500 Hz
D 2.4 kHz

B-003-010-011 **(C)**

When receiving CW, which of these frequency ranges is optimum for a band-pass filter?

A 300 Hz to 2700 Hz
B 100 Hz to 1100 Hz
C 750 Hz to 850 Hz
D 2100 Hz to 2300 Hz

B-003-011-001 **(A)**

What does chirp mean?

A A small change in the output frequency of a transmitter each time a dit or dah is sent
B A high-pitched tone which is received along with every CW dit and dah
C A slow change in transmitter frequency as the oscillator warms up
D An overload in a receiver's audio circuit whenever CW is received

B-003-011-002 **(B)**

What can be done to keep a CW transmitter from chirping?

A Add a low-pass filter
B Keep the power supply voltages very steady under varying loads
C Add a key click filter
D Keep the oscillator impedance very steady under the transmit load

B-003-011-003 **(B)**

What is the advantage of using a variable frequency oscillator in a basic CW transmitter?

A Greater suppression of harmonics
B Frequency is not constrained to the available crystals
C Use of higher speed Morse code is supported
D Greater suppression of key clicks

B-003-011-004 **(B)**

Which type of transmitter modulation changes the amplitude of an RF wave for the purpose of conveying information?

A Frequency modulation
B Amplitude modulation
C Phase modulation
D Frequency shift keying

B-003-011-005 **(D)**

In what emission mode does the instantaneous amplitude (envelope) of the RF signal vary with the modulating audio?

A Frequency modulation
B Pulse modulation
C Frequency shift keying
D Amplitude modulation

B-003-011-006 **(D)**

Morse code is usually transmitted by radio as:

A a series of key clicks
B a continuous carrier
C a phase-shifted carrier
D an interrupted carrier

B-003-011-007 **(B)**

You are transmitting using amplitude modulation. What bandwidth does your signal occupy if the highest frequency of your voice is 3 kHz?

A 9 kHz
B 6 kHz
C 3 kHz
D 12 kHz

B-003-011-008 **(C)**

What frequency components are present in the bandwidth of an amplitude modulated signal?

A One sideband
B Carrier and one sideband
C Carrier and two sidebands
D Two sidebands

B-003-011-009 **(A)**

An RF oscillator should be electrically and mechanically stable. This is to ensure that the oscillator does NOT:

A drift in frequency over time
B become overmodulated
C generate key clicks
D cause undue distortion

B-003-011-010 **(A)**

The DC power to the final stage of your transmitter is 200 watts and the RF output is 125 watts. What has happened to the rest of the power?

A It has been dissipated as heat
B It has been used to provide greater efficiency
C It has been used to provide negative feedback
D It has been used to provide positive feedback

B-003-011-011 **(B)**

The difference between DC input power and RF output power of a transmitter RF amplifier:

A radiates from the antenna
B appears as heat
C is lost in the transmission line
D is due to oscillations

B-003-012-001 **(D)**

What may happen if an SSB transmitter is operated with the microphone gain set too high?

A It may cause harmonic interference on higher bands
B It may cause interference to other stations operating on lower bands
C It may cause digital interference to computer equipment
D It may interfere with other stations operating near its frequency

B-003-012-002 **(C)**

What may happen if an SSB transmitter is operated with too much speech processing?

A It may cause insufficient modulation of the carrier
B It may cause interference to other stations operating on a higher frequency band
C It may cause audio distortion or splatter interference to other stations operating near its frequency
D It may cause digital interference to computer equipment

B-003-012-003 **(D)**

What is the term for the average power during one RF cycle, at the crest of the modulation envelope?

A RMS power
B Average radio frequency power
C Peak transmitter input power
D Peak envelope power

B-003-012-004 **(B)**

What is the usual bandwidth of an amateur radio single-sideband signal?

A Between 3 kHz and 6 kHz
B Between 2 kHz and 3 kHz
C 1 kHz
D 2 kHz

B-003-012-005 **(D)**

Why does the power amplifier of the SSB transmitter need to be linear?

A Hum and noise are reduced
B Power demand on the power supply is regulated
C Power output variations due to voice peaks are reduced
D Voice is unintelligible when amplified by a non-linear amplifier

B-003-012-006 **(D)**

What is one advantage of carrier suppression in a double sideband voice transmission?

A Only half the bandwidth is needed for the same information content
B Greater modulation percentage is obtainable with lower distortion
C Simpler equipment can be used to receive a double sideband suppressed carrier signal
D More of the output power can be put into the sidebands

B-003-012-007 **(B)**

What does overmodulation do to a single-sideband signal?

A It has higher fidelity and an improved signal-to-noise ratio
B It becomes distorted and occupies more bandwidth
C It increases the range of your signal
D It occupies less bandwidth and has a poor high frequency response

B-003-012-008 **(C)**

How should the microphone gain control be adjusted for voice operation on a single-sideband transmitter?

A For 100% frequency deviation on voice peaks
B For a dip in the drain or collector current
C Such that the maximum range on the ALC meter is never exceeded on voice peaks
D For full deflection of the ALC meter

B-003-012-009 **(A)**

The purpose of a balanced modulator in an SSB transmitter is to:

A suppress the carrier and pass the two sidebands
B make sure that the carrier and both sidebands are 180 degrees out of phase
C ensure that the percentage of modulation is kept constant
D suppress the carrier and pass one sideband

B-003-012-010 **(A)**

Your SSB transmitter is set to operate lower sideband at 7100 kHz. With a single 1000 Hz tone as modulation, at which frequency is RF transmitted?

A 7099 kHz
B 7101 kHz
C 6100 kHz
D 8100 kHz

B-003-012-011 **(A)**

The automatic level control (ALC) in an SSB transmitter:

A limits the input audio peaks so that the transmitter is not overdriven
B reduces transmitter audio feedback
C increases the occupied bandwidth
D reduces system noise

B-003-013-001 **(D)**

What causes the loud noise heard from an FM receiver in the absence of a signal?

A The additional gain following the discriminator
B The nature of atmospheric noise in the VHF range
C The higher intermediate frequency used in FM receivers
D The very large gain of stages ahead of the discriminator

B-003-013-002 **(D)**

You are using an FM repeater configured for 5 kHz deviation, but your transmitter is set to 2.5 kHz deviation. What is the consequence?

A Your audio will be distorted
B Your range will be shorter
C The repeater will not respond
D Your audio will be low

B-003-013-003 **(C)**

What term defines the change in frequency caused by modulation in an FM transmitter?

A Shift
B Modulation index
C Deviation
D Spectrum spread

B-003-013-004 **(C)**

What kind of emission would your FM transmitter produce if its microphone failed to work?

A An amplitude-modulated carrier
B A phase-modulated carrier
C An unmodulated carrier
D A frequency-modulated carrier

B-003-013-005 **(C)**

Why is FM voice best for local VHF/UHF radio communications?

A It is more resistant to distortion caused by reflected signals
B Its RF carrier stays on frequency better than the AM modes
C It provides a good signal-to-noise ratio at low RF signal levels
D The carrier is not detectable

B-003-013-006 **(D)**

What is the approximate bandwidth of a frequency modulated signal using 5 kHz deviation?

A Less than 5 kHz
B Between 5 kHz and 10 kHz
C Greater than 20 kHz
D Between 10 kHz and 20 kHz

B-003-013-007 **(A)**

How is a higher level of the modulating signal represented in an FM signal?

A By a larger excursion of the carrier frequency
B By a larger amplitude of the carrier
C By a larger pulse width in the transmitted wave train
D By a larger peak envelope power

B-003-013-008 **(D)**

What modulation method is most closely related to frequency modulation?

A Multiplex modulation
B Amplitude modulation
C Pulse modulation
D Phase modulation

B-003-013-009 **(A)**

Why isn't FM used as an amateur radio emission mode below 28 MHz?

A The bandwidth would exceed limits in the regulations
B The transmitter efficiency for this mode is low
C Harmonics could not be attenuated to practical levels
D The frequency stability would not be adequate

B-003-013-010 **(C)**

Several stations report that your FM transmission is loud and distorted, but on frequency. Which of the following is the most probable cause of the distortion?

A Excessive transmit power
B Cross-polarized antenna
C Speaking too loudly into the microphone
D Setting the wrong CTCSS tone

B-003-013-011 **(B)**

When more than one signal is present, the FM receiver is likely to demodulate only the strongest signal. What is this behaviour called?

A Surrender effect
B Capture effect
C Overpower effect
D Interference effect

B-003-014-001 **(C)**

What do many amateur radio operators use to help form good Morse code characters?

A Touchpad
B DTMF keypad
C Electronic keyer
D Straight key

B-003-014-002 **(B)**

How does an electronic keyer help form good Morse code characters?

A By ensuring that the dots and dashes have the same amplitude
B By regulating the lengths of the dits and dahs
C By eliminating key clicks
D By improving the tone of the CW signal

B-003-014-003 **(C)**

What do you need to adjust before using a microphone for the first time with a transceiver?

A Deviation control
B Automatic gain control level
C Microphone gain level
D Noise blanker threshold

B-003-014-004 **(A)**

What noise management system analyzes noise and signal characteristics to partially remove noise?

A DSP noise reduction
B Noise canceller (phasing)
C Noise limiter
D Noise blanker

B-003-014-005 **(B)**

What circuit causes a transmitter to automatically transmit when an operator speaks into its microphone?

A VFO
B VOX
C VXO
D VCO

B-003-014-006 **(D)**

What is the reason for using a properly adjusted speech processor with a single-sideband voice transmitter?

A It reduces average transmitter power requirements
B It reduces unwanted noise pickup from the microphone
C It improves voice frequency fidelity
D It improves the intelligibility of your signal

B-003-014-007 **(C)**

If a single-sideband voice transmitter is 100% modulated, how will using a speech processor affect the transmitter's output?

A Decrease the average power
B Decrease the peak envelope power
C Increase the average power
D Increase the peak envelope power

B-003-014-008 **(A)**

In a receiver, what noise management circuit recognizes high-amplitude short-duration pulses and removes them?

A Noise blanker
B Noise limiter
C Automatic level control
D Narrowband filter

B-003-014-009 **(A)**

What type of interference is a noise blanker circuit most effective in eliminating?

A Short-duration impulse-type noise
B Continuous wideband background noise
C Interfering signals on the same frequency
D Distortion from overdeviated signals

B-003-014-010 **(B)**

What is the function of transmit/receive switching in a transceiver?

A To allow more than one transmitter to be used
B To enable one antenna to be used for both transmitting and receiving
C To change antennas for operation on other frequencies
D To prevent RF currents entering the transmitter circuits

B-003-014-011 **(C)**

What type of microphone has internal components similar to a loudspeaker?

A Condenser
B Electret
C Dynamic
D Crystal

B-003-015-001 **(D)**

Why can a modern digital radio system transmit voice and images, not just data?

A Digital protocols can fall back to analog as needed
B Digital signals are continuously variable signals
C Modern transceivers have the necessary high efficiency amplifiers
D Any analog information can be converted to digital data

B-003-015-002 **(B)**

What is the fundamental difference between digital and analog data?

A Digital data requires complex waveforms for transmission
B Digital data is encoded as discrete pre-agreed values
C Digital data represents information as a continuously variable quantity
D Digital data easily translates into digital signals

B-003-015-003 **(C)**

What is the function of a digipeater?

A To receive analog FM, convert to digital data and retransmit
B To receive digital data, convert to analog FM and retransmit
C To receive digital data and retransmit data marked for retransmission
D To receive digital data and export to the internet

B-003-015-004 **(A)**

What does "network" mean in packet radio?

A A way of connecting packet-radio stations so data can be sent over long distances
B A way of connecting terminal-node controllers by telephone so data can be sent over long distances
C The connections on terminal-node controllers
D The programming in a terminal-node controller that rejects other callers if a station is already connected

B-003-015-005 **(D)**

Why can dozens of FT8 communications occur simultaneously in the space needed for one single-sideband transmission?

A Time interleaving of the transmissions
B Formatting of the messages into packets
C Message structure with limited contact information
D Narrow bandwidth of an FT8 signal

B-003-015-006 **(D)**

Which of these modes can work at the lowest signal-to-noise ratio as measured in a 2500 Hz bandwidth?

A PSK31
B RTTY
C CW
D FT8

B-003-015-007 **(C)**

When selecting an RTTY transmitting frequency, what minimum frequency separation from a contact in progress should you allow (centre to centre) to minimize interference?

A 3 kHz to 5 kHz
B 6 kHz to 10 kHz
C 250 Hz to 500 Hz
D 50 Hz to 100 Hz

B-003-015-008 **(D)**

When using a digital mode based on a computer sound card, how can you verify that the transmit audio level is NOT excessive?

A Ensure your transmitter's audio compression is set to maximum
B Verify that the automatic level control (ALC) is actively limiting every transmission
C Ask a local station to confirm your signal can be successfully decoded
D Ask a local station to confirm your signal is free of splatter

B-003-015-009 **(A)**

What feature of packet radio makes it especially useful for emergency communications?

A Reliable messaging (guaranteed delivery or notification of failure)
B Packet functionality is included in most modern radios
C Capable of simultaneous voice, image and data transmission
D Encrypted signals prevent eavesdropping

B-003-015-010 **(A)**

A digital protocol implements automatic repeat request (ARQ). What does it permit?

A Error correction
B Unattended operation
C Error detection
D Automatic link establishment

B-003-015-011 **(B)**

With a digital communication mode based on a computer sound card, what is the result of feeding excessive audio into the transmitter?

A Power amplifier overheating
B Splatter or out-of-channel emissions
C Higher signal-to-noise ratio
D Lower error rate

B-003-016-001 **(D)**

What approximate voltage does a standard automobile starter battery usually supply?

A 16 volts
B 28 volts
C 9 volts
D 12 volts

B-003-016-002 **(D)**

Which of the following has a positive terminal and a negative terminal?

A A potentiometer
B A fuse
C A resistor
D A battery

B-003-016-003 **(B)**

A battery, that can be repeatedly recharged by supplying it with electrical energy, is known as a:

A primary battery
B storage battery
C low leakage battery
D memory battery

B-003-016-004 **(B)**

Which of the following is a source of electromotive force (EMF)?

A Metal-film resistor
B Lithium-ion battery
C Germanium diode
D P-channel FET

B-003-016-005 **(B)**

Why is the NiMH battery often preferred over a conventional alkaline battery?

A It contains a liquid electrolyte
B It can be repeatedly recharged
C It provides a higher voltage
D It can be discarded without precautions

B-003-016-006 **(C)**

The voltage at a battery's terminals will drop when it supplies current. What is the cause of the drop?

A Current capacity
B Voltage capacity
C Internal resistance
D Electrolyte becoming dry

B-003-016-007 **(C)**

For portable operation, what is the primary advantage of lithium-based batteries over lead-acid batteries?

A Lower voltage per cell
B High tolerance to overcharge
C High battery capacity per kilogram
D Simple charging methods

B-003-016-008 **(D)**

Battery capacity is commonly stated as a value of current delivered over a specified period of time. What is the effect of exceeding that specified current?

A One or more cells may become short-circuited
B The battery will accept the subsequent charge in a shorter time
C The voltage delivered will be higher
D The battery will discharge more rapidly than specified

B-003-016-009 **(C)**

What voltage and capacity will you achieve by connecting two 12 volts, 20 ampere-hour batteries in parallel?

A 24 volts, 20 ampere-hours
B 24 volts, 40 ampere-hours
C 12 volts, 40 ampere-hours
D 6 volts, 80 ampere-hours

B-003-016-010 **(A)**

What voltage and capacity will you achieve by connecting two 12 volts, 20 ampere-hour batteries in series?

A 24 volts, 20 ampere-hours
B 24 volts, 40 ampere-hours
C 12 volts, 40 ampere-hours
D 6 volts, 80 ampere-hours

B-003-016-011 **(B)**

A lithium-ion battery should never be:

A left overnight at room temperature
B short-circuited
C recharged
D left disconnected

B-003-017-001 **(D)**

You construct a simple DC power supply using a transformer, rectifier and filter capacitor. If you use the supply to power a CW transmitter, what problem with signal quality could it cause?

A Key clicks
B Harmonics
C Overmodulation
D Chirp

B-003-017-002 **(D)**

What device converts 120 volts AC to 12 volts DC?

A Low-pass filter
B Inverter
C Power conditioner
D Power supply

B-003-017-003 **(B)**

When selecting a 13.8 V DC power supply for a transceiver, what design specification is most important?

A Voltage and current metering
B Output current capability
C Undervoltage protection
D Output connection compatibility

B-003-017-004 **(C)**

Compared to a switching (switch mode) power supply, why may a linear power supply be preferred?

A Higher efficiency
B Better regulation for FM equipment
C Lower risk of radio frequency noise
D Reduced physical dimensions and weight

B-003-017-005 **(A)**

In a mobile installation, why should the fuse in the DC line to the transceiver be located as near to the battery as possible?

A To protect the entire circuit
B To reduce the voltage drop in the radio's DC supply
C To prevent the vehicle's electronic systems causing noise
D To better absorb voltage transients

B-003-017-006 **(D)**

Apart from efficiency, what is one advantage of a switching (switch mode) power supply over a linear power supply?

A Lower risk of radio frequency noise
B Different simultaneous output voltages
C Simpler to repair
D Reduced physical dimensions and weight

B-003-017-007 **(A)**

Why are heavy-gauge wires used for a 100-watt transceiver's DC power connection?

A To minimize the voltage drop
B To prevent an electrical shock
C To avoid RF interference
D To minimize ripple

B-003-017-008 **(D)**

What are the nominal power-line voltages supplied to homes?

A 110 volts and 220 volts
B 100 volts and 200 volts
C 130 volts and 260 volts
D 120 volts and 240 volts

B-003-017-009 **(C)**

Your transceiver's user guide suggests limiting the voltage drop to 0.5 volts and the vehicle battery is 3 metres away. Given the losses listed below at the required current of 22 amperes, which minimum wire gauge must you use?

A Number 12, 0.11 V per metre
B Number 8, 0.05 V per metre
C Number 10, 0.07 V per metre
D Number 14, 0.19 V per metre

B-003-017-010 **(C)**

Why must the positive lead from the vehicle battery to your transceiver be fused?

A To reduce the voltage drop in the radio's DC supply
B To protect the radio from transient voltages
C To prevent an overcurrent situation from starting a fire
D To prevent interference to the vehicle's electronic systems

B-003-017-011 **(B)**

You have a very loud low-frequency hum appearing on your transmission. In what part of the transmitter would you first look for the trouble?

A The power amplifier circuit
B The power supply
C The variable-frequency oscillator
D The driver circuit

B-003-018-001 **(B)**

How could you best keep unauthorized persons from using your station at home?

A Put fuses in the main power line
B Use a key-operated on/off switch in the main power line
C Use a carrier-operated relay in the main power line
D Put a "Danger - High Voltage" sign in the station

B-003-018-002 **(C)**

How could you best keep unauthorized persons from using a mobile station in your car?

A Turn the radio off when you are not using it
B Put a "Do not touch" sign on the radio
C Remove the microphone when you are not using it
D Tune the radio to an unused frequency when you are done using it

B-003-018-003 **(D)**

What electrical hazard, if any, does the starter battery in a vehicle present?

A None, given its low voltage
B High electromagnetic fields
C Possibility of electric shock
D High short-circuit current

B-003-018-004 **(B)**

Why would there be a switch in a high-voltage power supply to turn off the power if its cabinet is opened?

A To turn the power supply off when it is not being used
B To keep anyone opening the cabinet from getting shocked by dangerous high voltages
C To keep dangerous RF radiation from leaking out through an open cabinet
D To keep dangerous RF radiation from coming in through an open cabinet

B-003-018-005 **(C)**

What is the minimum electrical current that can be fatal to the human body?

A 1 ampere
B 2 amperes
C 20 milliamperes
D 500 milliamperes

B-003-018-006 **(A)**

Which body organ can be fatally affected by a very small amount of electrical current?

A The heart
B The brain
C The liver
D The lungs

B-003-018-007 **(A)**

What is the lowest voltage that is usually considered hazardous to humans?

A 30
B 100
C 240
D 347

B-003-018-008 **(C)**

What should you do if you discover someone who is being burned by high voltage?

A Immediately drag the person away from the high voltage
B Run from the area so you won't be burned too
C Turn off the power, call for emergency help and provide first aid if needed
D Wait for a few minutes to see if the person can get away from the high voltage on their own, then try to help

B-003-018-009 **(C)**

What is the safest method to remove an unconscious person from contact with a high-voltage source?

A Call an electrician
B Remove the person by pulling an arm or a leg
C De-energize the power source before touching the person
D Wrap the person in a blanket and pull him to a safe area

B-003-018-010 **(B)**

Before checking a fault in a mains-operated power supply unit, it would be safest to first:

A remove and check the fuse from the power supply
B turn off the power and unplug the power cord
C short out the leads of the filter capacitor
D check the action of the capacitor bleeder resistance

B-003-018-011 **(A)**

What is the risk involved in troubleshooting a live power supply?

A Electric shock
B Damaging connected equipment
C Electromagnetic interference
D Blowing the fuse

B-003-019-001 **(D)**

For best protection from electrical shock, what should be grounded in your station?

A The transmission line
B The AC power line
C The power supply primary
D All station equipment

B-003-019-002 **(B)**

Established practice demands that all ground electrodes be bonded together with heavy conductors. What protection does this provide in case of a lightning strike?

A Reduces induced current by adding impedance
B Prevents voltage differences between devices
C Establishes a ground (reference) plane at the station
D Drains static electricity on a continuous basis

B-003-019-003 **(B)**

Why should you never use a fuse with a higher current rating than specified?

A A low current circuit may not function properly
B A fault may cause permanent damage, including a fire
C The fuse may open during normal operation
D Voltage delivered to the circuit would be limited

B-003-019-004 **(C)**

Which of these materials is best for a ground rod driven into the earth?

A Iron or steel
B Fibreglass
C Copper-clad steel
D Hard plastic

B-003-019-005 **(A)**

You need to work on a power supply that has been taken offline. What is the first thing you should do once the cabinet is open?

A Discharge the filter capacitors
B Bond the chassis to ground
C Place the unit on an insulating mat
D Short the AC input leads together

B-003-019-006 **(C)**

Where should the green wire in a three-wire AC line cord be connected in a power supply?

A To the "hot" side of the power switch
B To the fuse
C To the chassis
D To the white wire

B-003-019-007 **(A)**

Your third-floor station has a ground wire running 10 metres down to a ground rod. You get an RF burn when you touch your HF transceiver while transmitting. What is the likely cause?

A The ground wire has high impedance on your operating frequency
B The transmitting antenna is not the correct wavelength
C The gauge of the ground wire used is insufficient
D The ground connection of the wall outlet is defective

B-003-019-008 **(D)**

You are using an HF off-centre-fed (OCF) unbalanced antenna. When you transmit on SSB, distorted audio and noise are heard from an outboard amplified speaker. What device could you install in the transmission line to mitigate this problem?

A A low-pass filter
B A surge suppressor
C An antenna tuner
D A common-mode choke

B-003-019-009 **(A)**

What is a safe method to discharge power supply filter capacitors?

A Use an insulated shorting stick with an inline resistor
B Use a long screwdriver with an insulated handle
C Use an insulated wire with alligator clips on each end
D Allow time for bleeder resistors to discharge the capacitors

B-003-019-010 **(D)**

On mains-operated power supplies, the ground wire of the AC line is connected to the power supply chassis. What protection does this provide if a fault occurs in the power supply?

A Protects connected equipment from over voltage
B Prevents damage to the AC supply circuit breaker
C Prevents the equipment fuse from blowing unnecessarily
D Ensures the chassis does not become energized

B-003-019-011 **(D)**

Why do fuses have a voltage rating?

A To prevent dielectric breakdown of the fuse holder
B To limit current leakage to ground while in operation
C To ensure voltage transients can be safely dissipated
D To specify the voltage that can be interrupted without arcing

B-003-020-001 **(B)**

Why should you ground all antenna and rotator cables when your station is not in use?

A To prevent unauthorized persons from using the station
B To help protect the station equipment and building from lightning damage
C To lock the antenna system in one position
D To avoid radio frequency interference

B-003-020-002 **(B)**

You want to install a lightning surge protector on your transmission line, where should it be inserted?

A Anywhere on the line
B Outside, as close to earth grounding as possible
C Close to the antenna
D Behind the transceiver

B-003-020-003 **(B)**

How can your station equipment best be protected from lightning damage?

A Disconnect the ground system from all radios
B Disconnect all equipment from the power lines and antenna cables
C Use heavy insulation on the wiring
D Never turn off the equipment

B-003-020-004 **(A)**

What equipment should be worn for working on an antenna tower?

A Approved fall arrest equipment
B A reflective vest
C A pair of insulating gloves
D A positioning waist belt

B-003-020-005 **(D)**

Why should you wear approved fall arrest equipment if you are working on an antenna tower?

A To bring any tools you might use up and down the tower safely
B To keep the tower from becoming unstable while you are working
C To hold your tools so they don't fall and injure someone on the ground
D To limit injuries if you fall

B-003-020-006 **(A)**

For safety, how high should you place a horizontal wire antenna?

A High enough so that no one can touch any part of it from the ground
B Above high-voltage electrical lines
C Just high enough so you can easily reach it for adjustments or repairs
D As close to the ground as possible

B-003-020-007 **(A)**

Why should you wear a hard hat if you are on the ground helping someone work on an antenna tower?

A To protect your head from something dropped from the tower
B So you won't be hurt if the tower should accidentally fall
C To keep RF energy away from your head during antenna testing
D So someone passing by will know that work is being done on the tower and will stay away

B-003-020-008 **(C)**

Why should your outside antennas be high enough so that no one can touch them while you are transmitting?

A Touching the antenna might radiate harmonics
B Touching the antenna might cause television interference
C Touching the antenna might cause RF burns
D Touching the antenna might reflect the signal back to the transmitter and cause damage

B-003-020-009 **(C)**

Why should you make sure that no one can touch an open-wire transmission line while you are transmitting with it?

A Because contact might cause spurious emissions
B Because contact might cause a short circuit and damage the transmitter
C Because high-voltage radio energy might burn the person
D Because contact might break the transmission line

B-003-020-010 **(B)**

What safety precautions should you take before beginning repairs on an antenna?

A Ensure all masts to be installed are sufficiently light
B Be sure to turn off the transmitter and disconnect the transmission line
C Be sure the antenna structure is properly grounded
D Plan the operation in the shortest possible time to minimize fatigue

B-003-020-011 **(D)**

What safety precaution is especially important for a ground-mounted antenna?

A Ensure the feed point is at eye level
B Ensure the location is as dry as possible
C All radials should be buried at least 15 cm deep
D Ensure people are kept at a safe distance

B-003-021-001 **(C)**

What should you do for safety when operating at UHF and microwave frequencies?

A Make sure the standing wave ratio is low before you conduct a test
B Never use a horizontally polarized antenna
C Keep antenna away from your eyes when RF is applied
D Make sure that an RF leakage filter is installed at the antenna feed point

B-003-021-002 **(B)**

What should you do for safety if you put up a UHF transmitting antenna?

A Make sure that RF field screens are in place
B Make sure the antenna will be in a place where no one can get near it when you are transmitting
C Make sure the antenna is near the ground to keep its RF energy pointing in the correct direction
D Make sure you connect an RF leakage filter at the antenna feed point

B-003-021-003 **(B)**

What should you do for safety, before removing the shielding on a UHF power amplifier?

A Make sure all RF screens are in place at the amplifier output connector
B Make sure the amplifier cannot accidentally be turned on
C Make sure that RF leakage filters are connected
D Make sure the amplifier output connector is grounded

B-003-021-004 **(D)**

Why should you make sure the antenna of a hand-held transceiver is not close to your head when transmitting?

A To use your body to reflect the signal in one direction
B To keep static charges from building up
C To help the antenna radiate energy equally in all directions
D To reduce your exposure to the radio frequency energy

B-003-021-005 **(A)**

How should you position the antenna of a hand-held transceiver while you are transmitting?

A Away from your head and away from others
B Pointed towards the station you are contacting
C Pointed at the horizon
D Pointed down to bounce the signal off the ground

B-003-021-006 **(D)**

How can exposure to a large amount of RF energy affect body tissue?

A It lowers blood pressure
B It paralyzes the tissue
C It restricts blood flow
D It heats the tissue

B-003-021-007 **(C)**

Which body organ is the most likely to be damaged from the heating effects of RF radiation?

A Liver
B Hands
C Eyes
D Heart

B-003-021-008 **(D)**

How does the power density of an electromagnetic wave change as it propagates away from an antenna in free space?

A It decreases linearly with the distance
B It decreases in inverse proportion to the distance
C It decreases at a rate depending on ground absorption
D It decreases as the square of the distance

B-003-021-009 **(A)**

If you operate your station with indoor antennas, what precautions should you take when you install them?

A Locate the antennas as far away as possible from living spaces that will be occupied while you are operating

B Position the antennas parallel to electrical power wires to take advantage of parasitic effects

C Position the antennas along the edge of a wall where it meets the floor or ceiling to reduce parasitic radiation

D Locate the antennas close to your operating position to minimize transmission line length

B-003-021-010 **(A)**

Why should directional high-gain antennas be mounted higher than nearby structures?

A So they will not direct RF energy toward people in nearby structures

B So static electricity buildup is minimized

C So they will not damage nearby structures with RF energy

D So they will receive more sky waves and fewer ground waves

B-003-021-011 **(A)**

For best RF safety, where should the ends and centre of a dipole antenna be located?

A As high as possible to prevent people from coming in contact with the antenna

B Near or over moist ground so RF energy will be radiated away from the ground

C As close to the transmitter as possible so RF energy will be concentrated near the transmitter

D Close to the ground so simple adjustments can be easily made without climbing a ladder

B-004-001-001 **(B)**

What term describes a circuit designed to increase the amplitude of a signal?

A Multiplier

B Amplifier

C Modulator

D Oscillator

B-004-001-002 **(A)**

If an amplifier becomes non-linear, the output signal would:

A become distorted

B be reduced to zero

C cause oscillations

D overload the power supply

B-004-001-003 **(C)**

To increase the level of very weak radio signals from an antenna, you would use:

A an audio oscillator

B an audio amplifier

C an RF amplifier

D an RF oscillator

B-004-001-004 **(C)**

To increase the level of very weak signals from a microphone you would use:

A an RF amplifier

B an audio oscillator

C an audio amplifier

D an RF oscillator

B-004-001-005 **(A)**

What range of frequencies does the speech amplifier of an amateur radio transceiver typically process?

A 300 Hz to 3 000 Hz

B 3 Hz to 300 Hz

C 300 Hz to 1 000 Hz

D 40 Hz to 40 000 Hz

B-004-001-006 **(A)**

Apart from power and current, which signal property can amplifiers be specifically designed to increase?

A Voltage

B Phase

C Frequency

D Linearity

B-004-001-007 **(D)**

The increase in signal level by an amplifier is called:

A attenuation

B amplitude

C modulation

D gain

B-004-001-008 **(B)**

A device with gain has the property of:

A modulation
B amplification
C attenuation
D oscillation

B-004-001-009 **(A)**

A device labelled "Gain = 10 dB" is likely to be an:

A amplifier
B attenuator
C oscillator
D audio fader

B-004-001-010 **(B)**

What term describes the ratio of output power to DC input power of an amplifier?

A Loss factor
B Efficiency
C Current gain
D Dynamic range

B-004-001-011 **(C)**

What is the result of excessive positive feedback in an amplifier stage?

A Frequency response is flattened
B Voltage gain is reduced
C Oscillations appear
D Distortion is minimized

B-004-002-001 **(A)**

A diode is in series in the positive power lead to a transceiver. What is its purpose?

A Reverse polarity protection
B Protect against voltage transients
C Permit AC operation
D Overcurrent protection

B-004-002-002 **(A)**

One important application for diodes is recovering information from transmitted signals. This is referred to as:

A detection
B regeneration
C conversion
D biasing

B-004-002-003 **(A)**

The primary purpose of a Zener diode is to:

A regulate or maintain a constant voltage
B provide a voltage phase shift
C boost the power supply voltage
D provide a path through which current can flow

B-004-002-004 **(B)**

The action of changing alternating current to direct current is called:

A modulation
B rectification
C amplification
D transformation

B-004-002-005 **(C)**

The electrodes of a semiconductor diode are known as:

A collector and base
B cathode and drain
C anode and cathode
D gate and source

B-004-002-006 **(D)**

If alternating current is applied to the anode of a diode, what would you expect to see at the cathode?

A No signal
B Steady direct current
C Pulsating alternating current
D Pulsating direct current

B-004-002-007 **(D)**

In a semiconductor diode, electrons flow from:

A anode to cathode
B source to drain
C base to collector
D cathode to anode

B-004-002-008 **(B)**

What semiconductor device glows different colours, depending upon its chemical composition?

A A vacuum diode
B A light-emitting diode
C A fluorescent bulb
D A neon bulb

B-004-002-009 **(B)**

Which property of a semiconductor diode permits its use for reverse-polarity protection?

A It has high forward resistance
B It conducts in one direction only
C It has a high response speed
D Its peak inverse voltage is below 1 volt

B-004-002-010 **(B)**

In order for a diode to conduct, it must be:

A reverse biased
B forward biased
C close coupled
D enhanced

B-004-003-001 **(B)**

Which of these components can amplify a small signal using low voltages?

A Silicon-controlled rectifier
B Bipolar transistor
C Variable resistor
D Thyristor

B-004-003-002 **(A)**

What term describes the most basic semiconductor component used to amplify?

A Transistor
B Varactor
C P-N junction
D Diode

B-004-003-003 **(C)**

What are the three electrodes of a bipolar transistor?

A Collector, source and drain
B Gate, source and drain
C Collector, emitter and base
D Drain, base and source

B-004-003-004 **(D)**

If a low-level signal is placed at the input to a transistor and a higher level of the signal is produced at the output, what is this effect called?

A Detection
B Modulation
C Rectification
D Amplification

B-004-003-005 **(A)**

What prevents the substitution of a PNP transistor with an NPN transistor?

A The polarities are reversed
B The current gain would be too low
C The electrodes are labelled differently
D The frequency response would be limited

B-004-003-006 **(B)**

A semiconductor device is labelled as a "general purpose audio NPN device." What is it?

A Thyristor
B Bipolar transistor
C Field-effect transistor
D Triac

B-004-003-007 **(A)**

What are the two basic types of bipolar transistors?

A NPN and PNP
B Diode and triode
C Varicap and varistor
D P channel and N channel

B-004-003-008 **(D)**

Which of these operating conditions is most likely to cause a transistor to fail?

A Excessive light
B Saturation
C Cut-off
D Excessive heat

B-004-003-009 **(B)**

Which electrode of the bipolar transistor controls the output current?

A Source
B Base
C Emitter
D Collector

B-004-003-010 **(A)**

When a bipolar transistor is used as a switch, which electrode controls its state?

A Base
B Emitter
C Collector
D Gate

B-004-003-011 **(B)**

If a transistor is alternatively driven into saturation and cut-off, what does it behave like?

A A timer
B A switch
C An inverter
D An amplifier

B-004-004-001 **(C)**

When considering the material between source and drain, what are two basic types of field-effect transistors (FET)?

A Silicon and germanium
B Gallium and arsenide
C N channel and P channel
D NPN and PNP

B-004-004-002 **(C)**

Which semiconductor device has a gate, a drain and a source?

A Bipolar transistor
B Unijunction transistor
C Field-effect transistor
D Point-contact transistor

B-004-004-003 **(A)**

In a field-effect transistor, which electrode controls the resistance of the device's channel?

A Gate
B Drain
C Source
D Collector

B-004-004-004 **(C)**

In a field-effect transistor, from which electrode do charge carriers enter the channel?

A Drain
B Emitter
C Source
D Gate

B-004-004-005 **(A)**

In a field-effect transistor, from which electrode do charge carriers leave the channel?

A Drain
B Collector
C Source
D Gate

B-004-004-006 **(D)**

Why is a field-effect transistor considered a high impedance device?

A It uses high resistance semiconductors
B It functions at low voltage
C It functions at high current
D The gate never conducts current

B-004-004-007 **(B)**

What is the control electrode in a field-effect transistor?

A Base
B Gate
C Source
D Drain

B-004-004-008 **(D)**

In a field-effect transistor, what circuit parameter change causes the current to increase?

A The reverse bias is increased
B A forward bias is applied
C A forward bias is removed
D The reverse bias is decreased

B-004-004-009 **(A)**

Which electrode of a bipolar transistor corresponds to the source of a field-effect transistor?

A Emitter
B Base
C Drain
D Collector

B-004-004-010 **(C)**

Which electrode of a bipolar transistor corresponds to the drain of a field-effect transistor?

A Source
B Emitter
C Collector
D Base

B-004-004-011 **(C)**

In a field-effect transistor, which two electrodes are connected to the ends of the channel?

A Gate and drain
B Source and base
C Source and drain
D Source and gate

B-004-005-001 **(D)**

What is one reason a triode vacuum tube might be used instead of a transistor in a circuit?

A It uses less current
B It is much smaller
C It uses lower voltages
D It may be able to handle higher power

B-004-005-002 **(A)**

Which two elements of a triode carry the output current?

A Cathode and plate
B Cathode and grid
C Emitter and collector
D Source and drain

B-004-005-003 **(A)**

A feature common to triode tubes and transistors is that both:

A can amplify signals
B have electrons drifting through a vacuum
C dissipate heat when not conducting
D use heat to cause electron movement

B-004-005-004 **(C)**

Which electrode on a vacuum tube is operated with the highest positive voltage?

A Cathode
B Grid
C Plate
D Collector

B-004-005-005 **(B)**

Which semiconductor device has characteristics most similar to a triode vacuum tube?

A Bipolar transistor
B Field-effect transistor
C Triac
D Thyristor

B-004-005-006 **(D)**

Which electrode of a vacuum triode is the control element?

A Emitter
B Cathode
C Plate
D Grid

B-004-005-007 **(D)**

In a vacuum tube, which electrode emits electrons?

A Grid
B Collector
C Plate
D Cathode

B-004-005-008 **(B)**

What is inside the envelope of a triode tube?

A Neon
B A vacuum
C Argon
D Air

B-004-005-009 **(D)**

What term describes a vacuum tube with a cathode, a single grid and a plate?

A Diode
B Tetrode
C Pentode
D Triode

B-004-006-001 **(A)**

On resistors with four colour bands, which colour band specifies the tolerance?

A Fourth
B Third
C Second
D First

B-004-006-002 **(C)**

On a resistor with four colour bands, what do the first three colour bands indicate?

A The power rating in watts
B The resistance tolerance in percent
C The value of the resistor in ohms
D The resistance material

B-004-006-003 **(C)**

On a resistor with four colour bands, what does the fourth colour band indicate?

A The power rating in watts
B The resistance material
C The resistance tolerance in percent
D The value of the resistor in ohms

B-004-006-004 **(C)**

What are the possible values of a 100-ohm resistor with a 10% tolerance?

A 10 ohms to 100 ohms
B 80 ohms to 120 ohms
C 90 ohms to 110 ohms
D 90 ohms to 100 ohms

B-004-006-005 **(B)**

On resistors with four colour bands, which colour band differentiates two resistors rated at 33 ohms and 39 ohms respectively?

A First
B Second
C Third
D Fourth

B-004-006-006 **(A)**

Out of the list of resistor tolerances below, which has the highest precision?

A 0.1%
B 5%
C 10%
D 20%

B-004-006-007 **(A)**

Out of the list of resistor tolerances below, which has the lowest precision?

A 20%
B 0.1%
C 5%
D 10%

B-004-006-008 **(D)**

How does the resistance of a resistor change with rising ambient temperature?

A It increases
B It remains constant
C It decreases
D It depends on its temperature coefficient

B-004-006-009 **(D)**

Which resistor rating is specified as a given fraction per degree Celsius?

A Tolerance
B Power rating
C Ohmic value
D Temperature coefficient

B-004-006-010 **(A)**

On resistors with four colour bands, which colour band differentiates two resistors rated at 120 ohms and 1200 ohms respectively?

A Third
B First
C Second
D Fourth

B-004-006-011 **(D)**

Given that red=2, violet=7 and yellow=4, what is the nominal value of a resistor whose colour code reads "red," "violet" and "yellow"?

A 274 ohms
B 72 kilohms
C 27 megohms
D 270 kilohms

B-005-001-001 **(C)**

If a dial marked in megahertz shows a reading of 3.525 MHz, what would it show if it were marked in kilohertz?

A 3 525 000 kHz
B 352.5 kHz
C 3 525 kHz
D 35.25 kHz

B-005-001-002 **(C)**

If an ammeter marked in amperes is used to measure a 3000-milliampere current, what reading would it show?

A 0.3 amperes
B 0.03 amperes
C 3 amperes
D 0.003 amperes

B-005-001-003 **(B)**

How many hertz is 1 kHz?

A 10 000 Hz
B 1 000 Hz
C 10 Hz
D 100 Hz

B-005-001-004 **(A)**

How many microfarads is 1 000 000 picofarads?

A 1 microfarad
B 10 microfarads
C 0.01 microfarads
D 0.001 microfarads

B-005-001-005 **(A)**

If you have a hand-held transceiver that puts out 500 milliwatts, how many watts would this be?

A 0.5 watts
B 5 watts
C 50 watts
D 0.05 watts

B-005-001-006 **(C)**

A kilohm is:

A 0.001 ohms
B 10 ohms
C 1000 ohms
D 0.1 ohms

B-005-001-007 **(A)**

How many megahertz is 7040 kHz?

A 7.040 MHz
B 0.740 MHz
C 70.40 MHz
D 0.074 MHz

B-005-001-008 **(D)**

A current of one quarter ampere may be written as:

A 2.5 milliamperes
B 0.25 milliamperes
C 250 microamperes
D 250 milliamperes

B-005-001-009 **(A)**

How many millivolts equal two volts?

A 2 000 mV
B 0.000 002 mV
C 2 000 000 mV
D 0.002 mV

B-005-001-010 **(A)**

How can a frequency in megahertz be stated in gigahertz?

A Divide by 1 000
B Multiply by 1 000
C Divide by 1 000 000
D Multiply by 1 000 000

B-005-001-011 **(C)**

How many millihenries equal 10 000 microhenries?

A 1 millihenry
B 1000 millihenries
C 10 millihenries
D 100 millihenries

B-005-002-001 **(A)**

Which of these groups lists three good electrical conductors?

A Gold, silver and aluminum
B Gold, silver and wood
C Copper, aluminum and paper
D Copper, gold and mica

B-005-002-002 **(B)**

Which of these groups lists three good electrical insulators?

A Wood, copper and porcelain
B Glass, air and porcelain
C Plastic, wood and carbon
D Teflon, mica and aluminum

B-005-002-003 **(A)**

What do we call the flow of electric charge in a circuit?

A Current
B Voltage
C Resistance
D Capacitance

B-005-002-004 **(A)**

What is the best conductor among the following materials?

A Copper
B Carbon
C Silicon
D Aluminum

B-005-002-005 **(D)**

Which of these types of materials readily allows the flow of electric current?

A Insulator
B Semiconductor
C Dielectric
D Conductor

B-005-002-006 **(B)**

What electrical property causes an object to conduct electricity very well?

A Low admittance
B Low resistance
C Low reluctance
D Low capacitance

B-005-002-007 **(D)**

The letter "R" is the symbol for:

A impedance
B reluctance
C reactance
D resistance

B-005-002-008 **(D)**

What is the inverse of resistance?

A Reactance
B Reluctance
C Permeability
D Conductance

B-005-002-009 **(B)**

What is a voltage drop?

A The voltage output of a step-down transformer
B The loss of voltage caused by the flow of current through a circuit
C Any point in a circuit that has zero voltage
D The difference in voltage at the output terminals of a transformer

B-005-002-010 **(A)**

The resistance of a conductor changes with:

A temperature
B voltage
C current
D humidity

B-005-002-011 **(A)**

Which term describes the direction of current in a DC circuit?

A Polarity
B Polarization
C Directivity
D Phase

B-005-003-001 **(C)**

What term describes the rate at which electrical energy is used?

A Voltage
B Resistance
C Power
D Current

B-005-003-002 **(B)**

If you have light bulbs marked 40 watts, 50 watts, 60 watts and 100 watts, which one will consume electrical energy at the highest rate?

A The 40-watt bulb
B The 100-watt bulb
C The 60-watt bulb
D The 50-watt bulb

B-005-003-003 **(C)**

What is the basic unit of electrical power?

A The volt
B The ohm
C The watt
D The ampere

B-005-003-004 **(D)**

A circuit consists of a battery and load resistor. What circuit malfunction would cause no current to be drawn from the battery?

A A short circuit
B A reactive circuit
C A closed circuit
D An open circuit

B-005-003-005 **(D)**

Which electrical circuit draws too much current?

A A dead circuit
B A closed circuit
C An open circuit
D A short circuit

B-005-003-006 **(A)**

Power is expressed in:

A watts
B volts
C amperes
D ohms

B-005-003-007 **(A)**

Which of the following two quantities should be multiplied together to find power?

A Voltage and current
B Inductance and capacitance
C Voltage and inductance
D Resistance and capacitance

B-005-003-008 **(D)**

Which two electrical units multiplied together give the unit "watts"?

A Volts and farads
B Farads and henries
C Amperes and henries
D Volts and amperes

B-005-003-009 **(C)**

A resistor in a circuit becomes very hot and starts to burn. This is because the resistor is dissipating too much:

A resistance
B current
C power
D voltage

B-005-003-010 **(B)**

When speaking of electrical circuits, what does the term "continuity" mean?

A The circuit is rated for continuous operation
B The circuit is a closed circuit
C The circuit is designed for direct current (DC)
D The circuit is supplied with backup power

B-005-003-011 **(A)**

You have acquired a transceiver and connected it to a power supply. When you switch on the power supply, its fuse blows immediately. What circuit malfunction caused the fuse to blow?

A A short circuit
B An open circuit
C A resonant circuit
D A closed circuit

B-005-004-001 **(C)**

What is the voltage across a 2-ohm resistor if a current of 0.5 amperes flows through it?

A 2.5 volts
B 1.5 volts
C 1.0 volts
D 0.25 volts

B-005-004-002 **(C)**

How is the current in a DC circuit calculated when the voltage and resistance are known?

A Current equals resistance divided by voltage
B Current equals power divided by voltage
C Current equals voltage divided by resistance
D Current equals resistance multiplied by voltage

B-005-004-003 **(D)**

How is the resistance in a DC circuit calculated when the voltage and current are known?

A Resistance equals current multiplied by voltage
B Resistance equals power divided by voltage
C Resistance equals current divided by voltage
D Resistance equals voltage divided by current

B-005-004-004 **(B)**

How is the voltage in a DC circuit calculated when the current and resistance are known?

A Voltage equals power divided by current
B Voltage equals current multiplied by resistance
C Voltage equals current divided by resistance
D Voltage equals resistance divided by current

B-005-004-005 **(B)**

What is the resistance of a circuit that draws 0.25 amperes from a 12-volt source?

A 0.25 ohms
B 48 ohms
C 3 ohms
D 12 ohms

B-005-004-006 **(D)**

What value of resistance is required to drop 9 volts with a current of 10 milliamperes?

A 90 ohms
B 9 ohms
C 9000 ohms
D 900 ohms

B-005-004-007 **(B)**

If the current flowing through a 50-ohm resistor is 0.44 amperes, what voltage would you measure across the resistor?

A 0.22 volts
B 22 volts
C 222 volts
D 2.2 volts

B-005-004-008 **(D)**

A 30-ohm resistor is connected across a 6-volt battery. What current does it draw?

A 2 amperes
B 0.5 amperes
C 0.005 amperes
D 0.2 amperes

B-005-004-009 **(D)**

What voltage is needed to supply a current of 200 milliamperes to operate a relay that has a resistance of 25 ohms?

A 8 volts
B 0.5 volts
C 50 volts
D 5 volts

B-005-004-010 **(B)**

What formula calculates the resistance of a circuit when the voltage and current are known?

A R = E x I
B R = E / I
C R = I / E
D R = E squared / I

B-005-004-011 **(D)**

What is the resistance of a circuit if it draws 300 milliamperes from a 3-volt battery?

A 9 ohms
B 5 ohms
C 3 ohms
D 10 ohms

B-005-005-001 **(C)**

In a parallel circuit with a voltage source and several branch resistors, how is the total current related to the current in the branch resistors?

A It decreases as more parallel resistors are added to the circuit
B It is the sum of each resistor's voltage drop multiplied by the total number of resistors
C It equals the sum of the branch current through each resistor
D It equals the average of the branch current through each resistor

B-005-005-002 **(B)**

You connect four 100-ohm resistors in parallel across a 12-volt battery. How many milliamperes of current are drawn from the battery?

A 240 mA
B 480 mA
C 48 mA
D 120 mA

B-005-005-003 **(D)**

Several resistors of various values are connected in parallel. How does the total resistance of the combination compare to the individual resistors?

A It is greater than the largest resistor
B It equals the average of the resistors
C It equals the square root of the sum of the resistors
D It is less than the smallest resistor

B-005-005-004 **(C)**

Two 1000-ohm resistors are connected in parallel across a 12-volt battery. What is the total current?

A 60 milliamperes
B 120 milliamperes
C 24 milliamperes
D 12 milliamperes

B-005-005-005 **(C)**

The total resistance of resistors connected in series is:

A equal to the highest resistance present
B equal to the lowest resistance present
C greater than the resistance of any one resistor
D less than the resistance of any one resistor

B-005-005-006 **(B)**

What is the total resistance of five 10-ohm resistors in series?

A 2 ohms
B 50 ohms
C 5 ohms
D 10 ohms

B-005-005-007 **(C)**

Which of these series combination of resistors would replace a single 120-ohm resistor?

A Two 240-ohm resistors
B Five 100-ohm resistors
C Five 24-ohm resistors
D Six 22-ohm resistors

B-005-005-008 **(A)**

If ten resistors of equal value "R" are wired in parallel, what formula yields the total resistance?

A R / 10
B 10 / R
C 10 x R
D 10 + R

B-005-005-009 **(C)**

What is the total resistance of four 68-ohm resistors wired in parallel?

A 34 ohms
B 272 ohms
C 17 ohms
D 12 ohms

B-005-005-010 **(A)**

Two resistors are in parallel. Resistor "A" carries twice the current of resistor "B," which means that:

A "A" has half the resistance of "B"
B the voltage across "B" is twice that across "A"
C the voltage across "A" is twice that across "B"
D "B" has half the resistance of "A"

B-005-005-011 **(A)**

The total current in a parallel circuit is equal to the:

A sum of the currents through all the parallel branches
B source voltage divided by the value of one of the resistive elements
C source voltage divided by the sum of the resistive elements
D current in any one of the parallel branches

B-005-006-001 **(B)**

Why would a large size resistor be used instead of a smaller one of the same resistance?

A For less impedance in the circuit
B For greater power dissipation
C For better response time
D For higher conductance

B-005-006-002 **(B)**

A load requires 12 volts DC at 5 amperes. What is the minimum required power transformer rating?

A 6 watts
B 60 watts
C 17 watts
D 2.4 watts

B-005-006-003 **(B)**

What is the DC input power of a transmitter operating at 12 volts and drawing 500 milliamperes?

A 600 watts
B 6 watts
C 24 watts
D 60 watts

B-005-006-004 **(C)**

When two 500-ohm 1-watt resistors are connected in series, the maximum total power that can be dissipated by the resistors is:

A 0.5 watts
B 4 watts
C 2 watts
D 1 watt

B-005-006-005 **(A)**

When two 500-ohm 1-watt resistors are connected in parallel, they can dissipate a maximum total power of:

A 2 watts
B 0.5 watts
C 1 watt
D 4 watts

B-005-006-006 **(D)**

If the voltage applied to two resistors in series is doubled, how much will the total power change?

A Decrease to half
B Double
C Decrease to one quarter
D Increase four times

B-005-006-007 **(B)**

Which of these combinations of resistors could make up a 50-ohm dummy load capable of safely dissipating 5 watts?

A Ten quarter-watt 500-ohm resistors in parallel
B Four 2-watt 200-ohm resistors in parallel
C Two 5-watt 100-ohm resistors in series
D Two 2-watt 25-ohm resistors in series

B-005-006-008 **(B)**

How much current is drawn by a 12-volt, 30-watt light bulb?

A 0.4 amperes
B 2.5 amperes
C 18 amperes
D 4.8 amperes

B-005-006-009 **(A)**

What is the power consumption of two 10-ohm resistors connected in series with a 10-volt battery?

A 5 watts
B 2 watts
C 20 watts
D 0.5 watts

B-005-006-010 **(B)**

What is the advantage of replacing a 50-ohm resistor with a parallel combination of two 100-ohm resistors of the same power rating?

A Lesser resistance and same power rating
B Same resistance but greater power rating
C Same resistance but lesser power rating
D Greater resistance and same power rating

B-005-006-011 **(C)**

Resistor wattage ratings are:

A expressed in joules
B variable in steps of one hundred
C determined by heat dissipation qualities
D calculated according to physical size and tolerance rating

B-005-007-001 **(D)**

What is the term for the number of times per second an alternating current completes a positive to negative cycle?

A Speed
B Pulse rate
C Phase
D Frequency

B-005-007-002 **(D)**

What approximate range of frequencies can most humans hear?

A 20 Hz to 30 000 Hz
B 200 Hz to 200 000 Hz
C 300 Hz to 3 000 Hz
D 20 Hz to 20 000 Hz

B-005-007-003 **(C)**

Why is the range of frequencies from 20 Hz to 20 kHz termed audio frequencies?

A Because sound can be in this range but it's too low for RF signals
B Because RF signals in this range can be directly converted to sound
C Because the human ear can sense sound in this range
D Because this is the speaker response range of a modern SSB receiver

B-005-007-004 **(C)**

Electrical energy at a frequency of 7125 kHz is in what frequency range?

A Medium frequency (MF)
B Very High Frequency (VHF)
C High Frequency (HF)
D Low Frequency (LF)

B-005-007-005 **(B)**

What is the name for the distance an AC signal travels during one complete cycle?

A Wave spread
B Wavelength
C Wave speed
D Waveform

B-005-007-006 **(C)**

What happens to a signal's wavelength as its frequency increases?

A It decreases proportionally to frequency squared
B It increases proportionally to frequency squared
C It decreases
D It increases

B-005-007-007 **(A)**

What happens to a signal's frequency as its wavelength gets shorter?

A It increases
B It decreases
C It decreases proportionally to frequency squared
D It increases proportionally to frequency squared

B-005-007-008 **(A)**

What does 60 hertz (Hz) mean?

A 60 cycles per second
B 6000 metres per second
C 60 metres per second
D 6000 cycles per second

B-005-007-009 **(A)**

Two AC waveforms have the same frequency, but their cycles do not begin at the same instant. What term describes that timing difference?

A Phase
B Polarity
C Offset
D Delta

B-005-007-010 **(D)**

What is the shape of the waveform of the electricity supplied from a household receptacle?

A Complex wave
B Modified square wave
C Pulse wave
D Sine wave (sinusoidal)

B-005-007-011 **(C)**

A signal is composed of a fundamental frequency of 2 kHz and another of 4 kHz. What name is given to the 4 kHz signal?

A Sub-harmonic
B Intermodulation
C Harmonic
D Alias

B-005-008-001 **(C)**

A two-times increase in power results in a change of how many dB?

A 12 dB higher
B 1 dB higher
C 3 dB higher
D 6 dB higher

B-005-008-002 **(B)**

What change in transmitter power results in a 3 dB decrease?

A Divide the original power by 4
B Divide the original power by 2
C Divide the original power by 1.5
D Divide the original power by 3

B-005-008-003 **(D)**

What change in transmitter power results in a 6 dB increase?

A Multiply the original power by 3
B Multiply the original power by 2
C Multiply the original power by 1.5
D Multiply the original power by 4

B-005-008-004 **(D)**

If a signal transmitted with a power of 200 watts is received with an S-meter reading of "10 dB over S9," what would be the new reading if power was reduced to 20 watts?

A S9 plus 3 dB
B S9 minus 10 dB
C S9 plus 5 dB
D S9

B-005-008-005 **(D)**

If a signal transmitted with a power of 150 watts is received with an S-meter reading of "20 dB over S9," what would be the new reading if power was reduced to 15 watts?

A S9 plus 5 dB
B S9 plus 3 dB
C S9
D S9 plus 10 dB

B-005-008-006 **(D)**

What is the "decibel" used for?

A To describe a waveform on an oscilloscope
B To describe very high frequency radio waves
C To measure a single side band signal
D To measure the ratio of two signals

B-005-008-007 **(B)**

The power output from a transmitter increases from 1 watt to 2 watts. How many decibels does that increase represent?

A 1 dB
B 3 dB
C 10 dB
D 6 dB

B-005-008-008 **(A)**

The power of a transmitter is increased from 5 watts to 50 watts by a linear amplifier. The power gain, expressed in dB, is:

A 10 dB
B 30 dB
C 45 dB
D 20 dB

B-005-008-009 **(B)**

You add a 9 dB gain amplifier to your 2-watt hand-held. What is the power output of the combination?

A 18 watts
B 16 watts
C 11 watts
D 20 watts

B-005-008-010 **(D)**

The power of your transmitter is 100 watts and your transmission line introduces a loss of 6 dB. How much power is delivered to the antenna?

A 50 watts
B 17 watts
C 33 watts
D 25 watts

B-005-008-011 **(D)**

A local amateur radio operator reports receiving your 100-watt 2-metre simplex transmission with an S-meter reading of "30 dB over S9." What power could you use to reduce that reading to S9?

A 1 W
B 10 W
C 33.3 W
D 0.1 W

B-005-009-001 **(B)**

If two equal-value inductors are connected in series, what is their total inductance?

A The value of one inductor divided by 4
B Twice the value of one inductor
C Half the value of one inductor
D The value of one inductor times 4

B-005-009-002 **(A)**

If two equal-value inductors are connected in parallel, what is their total inductance?

A Half the value of one inductor
B Twice the value of one inductor
C The value of one inductor times 4
D The value of one inductor divided by 4

B-005-009-003 **(A)**

If two equal-value capacitors are connected in series, what is their total capacitance?

A Half the value of either capacitor
B Twice the value of one capacitor
C The value of one capacitor times 4
D The value of one capacitor divided by 4

B-005-009-004 **(A)**

If two equal-value capacitors are connected in parallel, what is their total capacitance?

A Twice the value of one capacitor
B Half the value of either capacitor
C The value of one capacitor times 4
D The value of one capacitor divided by 4

B-005-009-005 **(D)**

You are constructing an air-core inductor using a coil of wire. What parameters determine its inductance?

A Coil diameter, coil length and operating frequency
B Type of wire, coil length and number of turns of wire
C Coil diameter, coil orientation and number of turns of wire
D Coil diameter, coil length and number of turns of wire

B-005-009-006 **(B)**

A capacitor is made of two identical metal plates separated by air. What parameters determine its capacitance?

A Surface area of the plates and applied voltage
B Surface area of the plates and spacing between the plates
C Operating frequency and spacing between the plates
D Type of metal and spacing between the plates

B-005-009-007 **(B)**

What precaution must you take when using polarized electrolytic capacitors?

A Do not use them in series combinations
B Never apply a reverse voltage
C Do not parallel with capacitors other than electrolytics
D Use them exclusively at radio frequencies

B-005-009-008 **(B)**

If you wire two 12-millihenry chokes in series, what is the inductance of the combination?

A 3 millihenries
B 24 millihenries
C 6 millihenries
D 48 millihenries

B-005-009-009 **(C)**

If you wire two 20-millihenry inductors in parallel, what is the inductance of the combination?

A 80 millihenries
B 5 millihenries
C 10 millihenries
D 40 millihenries

B-005-009-010 **(D)**

If you wire two 20-microfarad capacitors in series, what is the capacity of the combination?

A 40 microfarads
B 80 microfarads
C 5 microfarads
D 10 microfarads

B-005-009-011 **(B)**

If you wire two 24-microfarad capacitors in parallel, what is the capacity of the combination?

A 4 microfarads
B 48 microfarads
C 12 microfarads
D 96 microfarads

B-005-010-001 **(B)**

How does an inductor react to AC?

A As the frequency of the applied AC increases, the reactance decreases
B As the frequency of the applied AC increases, the reactance increases
C As the amplitude of the applied AC increases, the reactance decreases
D As the amplitude of the applied AC increases, the reactance increases

B-005-010-002 **(C)**

How does a capacitor react to AC?

A As the amplitude of the applied AC increases, the reactance increases
B As the amplitude of the applied AC increases, the reactance decreases
C As the frequency of the applied AC increases, the reactance decreases
D As the frequency of the applied AC increases, the reactance increases

B-005-010-003 **(D)**

The reactance of capacitors increases as:

A applied voltage increases
B applied voltage decreases
C frequency increases
D frequency decreases

B-005-010-004 **(A)**

What is the term for the opposition to alternating current caused by the combined effect of reactance and resistance?

A Impedance
B Reluctance
C Admittance
D Conductance

B-005-010-005 **(A)**

What term equals the ratio of AC voltage to AC current in a system or circuit?

A Impedance
B Resistance
C Reactance
D Conductance

B-005-010-006 **(D)**

What circuit parameter change causes an inductor's reactance to increase?

A A decrease in frequency
B An increase in current
C An increase in voltage
D An increase in frequency

B-005-010-007 **(B)**

What property allows a coil wound on a ferrite core to mitigate the effects of an offending radio signal?

A High reactance at audio frequencies
B High reactance at radio frequencies
C Low reactance at radio frequencies
D Low reactance at audio frequencies

B-005-010-008 **(B)**

What property allows a bypass capacitor in an audio circuit to divert an interfering RF signal?

A High reactance at audio frequencies
B Low reactance at radio frequencies
C High reactance at radio frequencies
D Low reactance at audio frequencies

B-005-010-009 **(A)**

What property allows an RF bypass capacitor to have little effect on an audio circuit?

A High reactance at audio frequencies
B Low reactance at radio frequencies
C High reactance at radio frequencies
D Low reactance at audio frequencies

B-005-010-010 **(A)**

What property allows an RF choke coil to have little effect on signals meant to flow through the coil?

A Low reactance at low frequencies
B High reactance at low frequencies
C Low reactance at high frequencies
D High reactance at high frequencies

B-005-010-011 **(C)**

In general, the reactance of inductors increases with:

A decreasing applied voltage
B increasing applied voltage
C increasing AC frequency
D decreasing AC frequency

B-005-011-001 **(B)**

A transformer with a 120-volt primary voltage supplies 250 watts to a transmitter. Neglecting losses, what is the approximate primary current?

A 3.1 amperes
B 2.1 amperes
C 0.48 amperes
D 1.4 amperes

B-005-011-002 **(B)**

How can a transformer with two windings change impedance?

A By matching winding resistance to impedance
B By carrying different voltages and currents in each winding
C By using the correct magnetic coupling between windings
D By allowing the difference to be dissipated in core losses

B-005-011-003 **(B)**

A transformer with a single 12-volt secondary draws 0.5 amperes through its 120-volt primary. Assuming no losses, what current is drawn from the secondary?

A 50 amperes
B 5 amperes
C 2.5 amperes
D 25 amperes

B-005-011-004 **(D)**

The primary winding of a transformer has 250 turns, and the secondary has 500 turns. If the input voltage is 120 volts, what is the secondary voltage?

A 480 V
B 620 V
C 60 V
D 240 V

B-005-011-005 **(A)**

The strength of the magnetic field around a conductor in air is:

A directly proportional to the current in the conductor
B inversely proportional to the diameter of the conductor
C directly proportional to the diameter of the conductor
D inversely proportional to the voltage on the conductor

B-005-011-006 **(D)**

Maximum induced voltage in a coil occurs when:

A the current through the coil is DC
B current is going through its least rate of change
C the magnetic field around the coil is not changing
D current is going through its greatest rate of change

B-005-011-007 **(A)**

A transformer primary winding consumes 10 watts. Neglecting losses, if the secondary voltage is 5 volts, what is the secondary current?

A 2 amperes
B 0.5 amperes
C 1 ampere
D 5 amperes

B-005-011-008 **(D)**

A step-up transformer with a primary to secondary turns ratio of 1:5 delivers 50 milliamperes to a load. Assuming 100% efficiency, what is the primary current?

A 2500 mA
B 10 mA
C 0.25 mA
D 250 mA

B-005-011-009 **(B)**

When is coupling (induction) between two wires maximum?

A When the wires are separated and at right angles
B When the wires are close and parallel
C When the wires are close and at right angles
D When the wires are separated and parallel

B-005-011-010 **(B)**

A permanent magnet would most likely be made from:

A brass
B steel
C copper
D aluminum

B-005-011-011 **(A)**

What confirms the fact that the transfer of energy from the primary to the secondary of a transformer is not perfect?

A Warm iron laminations
B Noisy operation
C Large secondary current
D High primary voltage

B-005-012-001 **(C)**

Resonance is the condition that exists when:

A the circuit contains no resistance
B resistance is equal to the reactance
C inductive reactance and capacitive reactance are equal
D inductive reactance is the only opposition in the circuit

B-005-012-002 **(A)**

At resonance, what impedance does a parallel tuned circuit exhibit?

A High impedance
B Low impedance
C Impedance equal to reactance of the circuit
D Impedance equal to resistance of the circuit

B-005-012-003 **(A)**

While the resonant frequency of a tuned circuit is a single frequency, the effect of resonance is significant over a certain range of frequencies. What is this range called?

A Bandwidth
B Quality factor
C Shape factor
D Response curve

B-005-012-004 **(B)**

What two components are required to form a tuned circuit?

A Diode and transistor
B Inductor and capacitor
C Resistor and transistor
D Capacitor and resistor

B-005-012-005 **(A)**

When a parallel coil-capacitor combination is supplied with AC of different frequencies, there will be one frequency where the impedance will be highest. This is the:

A resonant frequency
B maximum frequency
C inductive frequency
D reactive frequency

B-005-012-006 **(A)**

In a parallel-resonant circuit at resonance, the circuit has:

A high impedance
B low impedance
C low mutual inductance
D high mutual inductance

B-005-012-007 **(B)**

In a series resonant circuit at resonance, the circuit has:

A high mutual inductance
B low impedance
C high impedance
D low mutual inductance

B-005-012-008 **(A)**

A coil and an air-spaced capacitor are arranged to form a resonant circuit. The resonant frequency will remain the same if we:

A add a resistor to the circuit
B increase the area of plates in the capacitor
C insert Mylar sheets between the plates of the capacitor
D wind more turns on the coil

B-005-012-009 **(A)**

Resonant circuits in a receiver are used to:

A select the desired signal frequencies
B filter direct current
C amplify audio signals
D adjust voltage levels

B-005-012-010 **(A)**

Resonance is the condition that exists when:

A inductive reactance and capacitive reactance are equal and opposite in sign
B inductive reactance is the only opposition in the circuit
C the circuit contains no resistance
D resistance is equal to the reactance

B-005-012-011 **(A)**

What happens to current when a series RLC circuit is tuned to the frequency of the source?

A It reaches maximum
B It is limited by inductive reactance
C It is limited by capacitive reactance
D It reaches minimum

B-005-013-001 **(C)**

How is a voltmeter usually connected to a circuit under test?

A In quadrature with the circuit
B In phase with the circuit
C In parallel with the circuit
D In series with the circuit

B-005-013-002 **(B)**

How is an ammeter usually connected to a circuit under test?

A In parallel with the circuit
B In series with the circuit
C In quadrature with the circuit
D In phase with the circuit

B-005-013-003 **(B)**

What does a multimeter measure?

A SWR and power
B Voltage, current and resistance
C Resistance, capacitance and inductance
D Resistance and reactance

B-005-013-004 **(D)**

What is the correct instrument to measure the final power amplifier current?

A An ohmmeter
B A wattmeter
C A voltmeter
D An ammeter

B-005-013-005 **(A)**

When measuring the voltage across a circuit component, what does the voltmeter appear to be in the circuit?

A A high value resistance
B A low value resistance
C An open circuit
D A perfect conductor

B-005-013-006 **(C)**

When measuring current drawn from a DC power supply, what does the ammeter placed in the circuit appear as?

A An additional load
B A high value resistance
C A low value resistance
D A perfect conductor

B-005-013-007 **(A)**

What instrument can provide a direct measurement of power at the output of a transmitter?

A RF wattmeter
B Wavemeter
C Field-strength meter
D Ammeter

B-005-013-008 **(B)**

Potential difference is measured by means of:

A an ammeter
B a voltmeter
C a wattmeter
D an ohmmeter

B-005-013-009 **(A)**

What instrument is used to measure electrical current?

A Ammeter
B Wavemeter
C Wattmeter
D Voltmeter

B-005-013-010 **(B)**

What term describes the ability of an instrument to display values that are true to reality?

A Stability
B Accuracy
C Precision
D Resolution

B-006-001-001 **(C)**

What connects your transceiver to your antenna?

A A ground wire
B A radial wire
C A transmission line
D A counterpoise wire

B-006-001-002 **(A)**

The characteristic impedance of a transmission line is determined by the:

A physical dimensions and relative positions of the conductors
B length of the line
C frequency at which the line is operated
D load placed at the end of the line

B-006-001-003 **(C)**

The characteristic impedance of a 20-metre piece of transmission line is 52 ohms. What would the impedance be if 10 metres were cut off?

A 104 ohms
B 13 ohms
C 52 ohms
D 26 ohms

B-006-001-004 **(B)**

Why can coaxial cables of different diameters have the same characteristic impedance?

A Their characteristic impedance depends on operating frequency
B Their characteristic impedance depends on the ratio of conductor diameters
C Characteristic impedance is independent of line diameter
D Characteristic impedance is set by the choice of conducting material

B-006-001-005 **(C)**

What commonly available transmission line can be buried directly in the ground for some distance without adverse effects?

A 600-ohm open-wire line
B 75-ohm twin-lead
C Coaxial cable
D 300-ohm window line

B-006-001-006 **(D)**

A transmitter is delivering radio frequency (RF) energy into a coaxial cable with a characteristic impedance of 50 ohms. The cable is terminated by a purely resistive load. What value of load resistance will absorb all the RF energy it receives?

A 25 ohms
B 100 ohms
C 200 ohms
D 50 ohms

B-006-001-007 **(D)**

What is the major factor influencing the velocity factor of a coaxial cable?

A Center conductor material
B Size and spacing of the conductors
C Use of a solid or braided shield
D Dielectric material

B-006-001-008 **(B)**

The characteristic impedance of an open-wire transmission line depends, in part, on the diameter of its conductors. What other dimension determines its characteristic impedance?

A Distance to metal structures
B Spacing of the conductors
C Length of the line
D Height above ground

B-006-001-009 **(D)**

A transmission line is terminated by an impedance that differs significantly from the characteristic impedance of the line. What impedance will be measured at the input of the line?

A An infinite impedance
B A zero impedance
C An impedance nearly equal to the characteristic impedance
D A value of impedance influenced by line length

B-006-001-010 **(A)**

What factors determine the characteristic impedance of an open-wire transmission line?

A The distance between the centres of the conductors and the diameter of the conductors
B The distance between the centres of the conductors and the length of the line
C The radius of the conductors and the frequency of the signal
D The frequency of the signal and the length of the line

B-006-001-011 **(A)**

What factors determine the characteristic impedance of a coaxial transmission line?

A The ratio of the diameter of the outer shield to the diameter of the inner conductor
B The diameter of the shield and the length of the line
C The diameter of the shield and the frequency of the signal
D The frequency of the signal and the length of the line

B-006-002-001 **(D)**

What kind of transmission line has a centre wire inside an insulating material that is covered by a metal shield or sleeve?

A Window line
B Open-wire line
C Waveguide
D Coaxial cable

B-006-002-002 **(B)**

What kind of transmission line has two wires side-by-side embedded in insulating material?

A Open-wire line
B Window line
C Coaxial cable
D Waveguide

B-006-002-003 **(A)**

What kind of transmission line is made of two conductors held apart by insulated rods?

A Open-wire line
B Coaxial cable
C Window line
D Twisted pair

B-006-002-004 **(C)**

What is the purpose of a balun?

A Shunt common-mode current to ground
B Balance antenna impedance
C Connect balanced and unbalanced systems
D Increase antenna gain

B-006-002-005 **(C)**

Where would you install a balun to feed a dipole antenna with 50-ohm coaxial cable?

A Between the antenna and the ground
B Between the coaxial cable and the ground
C Between the coaxial cable and the antenna
D Between the transmitter and the coaxial cable

B-006-002-006 **(D)**

What causes a transmission line to be unbalanced?

A The conductors are twisted together
B One conductor has a poor connection at the antenna
C The conductors have deteriorated insulation
D One conductor is connected to ground

B-006-002-007 **(A)**

What device can be installed to feed a balanced antenna with an unbalanced transmission line?

A A balun
B A triaxial transformer
C A wave trap
D A loading coil

B-006-002-008 **(D)**

What device should you use to connect a coaxial cable to window line?

A A surge suppressor
B A phasing harness
C A tuning stub
D A balun

B-006-002-009 **(C)**

A balanced transmission line:

A carries RF current on one wire only
B is made of one conductor only
C is made of two parallel wires
D has one conductor inside the other

B-006-002-010 **(B)**

Your antenna tuner does not have a balanced output and you wish to use window line to feed an HF antenna. What device should you use between the tuner and the transmission line?

A Autotransformer
B Balun
C Transmission line stub
D Quarter-wave transformer

B-006-002-011 **(C)**

What kind of transmission line has two conductors maintained side by side, a constant distance apart, using insulated spreaders?

A Twin-lead
B Twisted pair
C Open-wire line
D Coaxial cable

B-006-003-001 **(C)**

A transmission line must be supported for several metres by attaching it to a metal fence. What type of transmission line will NOT be adversely affected by proximity to the fence?

A Open-wire line
B Window line
C Coaxial cable
D Twin-lead

B-006-003-002 **(C)**

A common-mode current choke can be made by winding coaxial cable on a ferrite toroid. Why is cable with solid dielectric preferred over foam dielectric?

A More flexible and easier to handle
B More impedance to common-mode current
C Less risk of a short due to centre conductor movement
D Less impedance inserted in the signal path

B-006-003-003 **(D)**

Why do most amateur radio antenna systems use coaxial cable, rather than other types of transmission line?

A Less loss
B More power handling capability
C Less expensive
D More usable in a wide variety of settings

B-006-003-004 **(A)**

What type of connector is commonly installed on RG-213 coaxial cable for connection to an HF transceiver?

A A PL-259 connector
B An F-type connector
C An SMA connector
D A BNC connector

B-006-003-005 **(B)**

What type of connector usually joins a modern hand-held transceiver to its antenna?

A An RCA connector
B An SMA connector
C A PL-259 connector
D An F-type connector

B-006-003-006 **(A)**

Which popular RF connector is designed to be moisture resistant?

A N
B UHF
C BNC
D SMA

B-006-003-007 **(A)**

What type of RF connector is commonly used for low-power transceivers and test instruments?

A BNC
B N
C UHF
D RCA

B-006-003-008 **(A)**

Why should you regularly clean and tighten all antenna connectors?

A To help keep their contact resistance at a minimum
B To minimize dielectric losses
C To maintain lightning protection
D To prevent static electricity buildup

B-006-003-009 **(B)**

What type of coaxial outer conductor offers the best shielding?

A Double braided shield
B Solid shield
C Aluminum foil
D Single braided shield

B-006-003-010 **(A)**

If your location is frequently affected by icing conditions, which type of transmission line would be the most suitable?

A Coaxial cable
B Open-wire line
C Window line
D Twin-lead

B-006-003-011 **(D)**

What is the primary advantage of choosing a coaxial cable with a foam dielectric instead of a solid dielectric?

A Higher power handling
B Lower velocity factor
C Better mechanical stability
D Lower loss

B-006-004-001 **(B)**

What is the major adverse consequence of using RG-58 coaxial cable for a transmission line operating on the 70 cm band?

A Excess transmission line heating
B Excess RF loss in the transmission line
C Excess reflections at the antenna feed point
D Excess RF radiation from the transmission line

B-006-004-002 **(A)**

What is the major advantage of open-wire transmission line?

A It can be operated at high SWR without excessive loss
B It can be located near metal objects without problems
C It has low impedance, which facilitates matching to a transceiver
D It does not radiate RF energy, which could cause interference to nearby equipment

B-006-004-003 **(D)**

If your transmitter and antenna are 15 metres apart, but are connected by 60 metres of RG-58 coaxial cable, what should be done to reduce transmission line loss?

A Install a balun at the antenna feed point
B Roll the excess cable into a coil
C Install a low-pass filter at the transceiver
D Shorten the excess cable

B-006-004-004 **(A)**

As the length of a transmission line is changed, what happens to signal loss?

A Signal loss increases as the length increases
B Signal loss decreases as the length increases
C Signal loss is the least when the length is the same as the signal's wavelength
D Signal loss is the same for any length of transmission line

B-006-004-005 **(A)**

As the frequency of a signal is changed, what happens to signal loss in a transmission line?

A Signal loss increases with increasing frequency
B Signal loss increases with decreasing frequency
C Signal loss increases as the square of frequency
D Signal loss is the same for any frequency

B-006-004-006 **(D)**

Assuming the same transmitter and RF output power are used, what is the effect of changing the transmission line from RG-213 coaxial cable to RG-58?

A More RF power is radiated from the antenna
B SWR at the transmitter increases
C SWR at the transmitter decreases
D Less RF power is radiated from the antenna

B-006-004-007 **(B)**

The lowest loss transmission line on HF is:

A 300-ohm twin-lead
B open-wire line
C 75-ohm twin-lead
D coaxial cable

B-006-004-008 **(D)**

In what values are RF transmission line losses expressed?

A Ohms per MHz
B Decibel per MHz
C Ohms per metre
D Decibel per unit length

B-006-004-009 **(C)**

If the length of a coaxial transmission line is increased from 20 metres to 40 metres, how would this affect the line loss?

A It would be increased by 10%
B It would be increased by 20%
C It would be increased by 100%
D It would be increased by 50%

B-006-004-010 **(A)**

If the operating frequency is increased, how does the transmission line loss change?

A Loss increases, due to internal line losses
B Loss increases, due to increased wave velocity
C Loss decreases, due to skin effect
D Loss decreases, due to decreased SWR

B-006-005-001 **(B)**

What does an SWR reading of 1:1 mean?

A An antenna tuner is needed at the transmitter
B The best impedance match has been attained
C Reflected power equals forward power
D An impedance transformer is needed at the antenna feed point

B-006-005-002 **(D)**

What does an SWR reading of less than 1.5:1 mean?

A An impedance match that is too low
B A serious impedance mismatch, something may be wrong with the antenna system
C An antenna gain of 1.5
D A fairly good impedance match

B-006-005-003 **(A)**

What is the most likely cause of erratic readings on an SWR meter?

A Intermittent connection in the antenna system
B Transmitting into the wrong antenna
C Interference from electrical power lines
D Lack of a balun at the antenna feed point

B-006-005-004 **(D)**

Which of the following can cause a high SWR reading?

A Grounding the shield of the coaxial cable at the building entrance
B Using a very long transmission line
C Replacing RG-213 coaxial cable with RG-58
D An open or short circuit in the antenna system

B-006-005-005 **(C)**

What is the main adverse effect due to operating with high SWR?

A Increased transmission line radiation
B Increased common-mode current
C Increased transmission line loss
D Increased receive noise level

B-006-005-006 **(A)**

What instrument is useful in adjusting the physical length of an antenna?

A Antenna analyzer
B Multimeter
C Capacitance meter
D Frequency meter

B-006-005-007 **(B)**

If the characteristic impedance of the transmission line does not match the antenna input impedance then:

A the antenna will not radiate any signal
B standing waves are produced in the transmission line
C heat is produced at the junction
D the SWR reading falls to 1:1

B-006-005-008 **(C)**

The result of the presence of standing waves on a transmission line is:

A maximum transfer of energy to the antenna from the transmitter
B lack of radiation from the transmission line
C reduced transfer of RF energy to the antenna
D perfect impedance match between transmitter and transmission line

B-006-005-009 **(B)**

What does an SWR meter measure to determine the SWR?

A Common-mode current
B Forward and reflected voltage
C Radiated RF energy
D Conductor temperature

B-006-005-010 **(C)**

What information can be obtained with an antenna analyzer?

A Gain of the antenna
B Front-to-back ratio of the antenna
C SWR of the antenna system over a range of frequencies
D Radiation pattern of the antenna

B-006-005-011 **(A)**

What is the effect of line loss on the SWR reading at the station?

A It decreases the SWR, because reflected energy is attenuated
B It decreases the SWR, because less power reaches the antenna
C It has no effect, because SWR compares voltages
D It has no effect, because forward and reflected power are both affected

B-006-006-001 **(A)**

Which of the following antenna system conditions will cause a modern solid-state HF transceiver to automatically reduce power?

A Excessive impedance mismatch between transceiver and transmission line
B Transmitting to a balanced antenna with an unbalanced transmission line
C Open circuit in lightning surge protector ground connection
D Excessive antenna element movement in high winds

B-006-006-002 **(D)**

What does an antenna tuner do?

A It helps a receiver automatically tune in stations that are far away
B It switches an antenna system to a transmitter when sending, and to a receiver when listening
C It switches multiple transceivers to a common transmission line and antenna
D It matches a transceiver to a mismatched antenna system

B-006-006-003 **(D)**

An end-fed half-wave antenna (EFHW) has a very high feed point impedance. What device could be used to provide a good match to 50-ohm coaxial cable?

A A quarter-wave stub
B A counterpoise
C A good ground on the coax shield
D A transformer

B-006-006-004 **(D)**

If both source and load impedances are purely resistive, what value of load impedance will result in maximum power delivery to the load?

A Load impedance equal to half of the source impedance
B Load impedance equal to twice the source impedance
C Load impedance equal to the square root of source impedance
D Load impedance equal to the source impedance

B-006-006-005 **(B)**

What is the advantage of locating an antenna tuner near the antenna feed point, over locating it near the transceiver?

A More usable bandwidth
B Less transmission line loss
C More harmonic suppression
D Less atmospheric noise pickup

B-006-006-006 **(C)**

How does an antenna tuner compensate for an impedance mismatch in an antenna system?

A By increasing the conductance of the transmission line
B By adjusting the resonant frequency of the antenna
C By adding capacitive or inductive reactance
D By diverting reflections to a dummy load

B-006-006-007 **(B)**

What advantage does a transformer present when used for impedance matching at radio frequencies?

A It isolates the source from reflections
B It can be designed to do so over a wide bandwidth
C It supports larger power than reactive components
D It provides constant voltage to the load

B-006-006-008 **(C)**

Where does impedance matching need to be done to minimize transmission line losses in an antenna system?

A Anywhere along the transmission line
B At a quarter wavelength from the transmitter
C At the junction between the transmission line and antenna
D At the junction between the transmitter and the transmission line

B-006-006-009 **(D)**

If an antenna is correctly matched to a transmission line, the length of the transmission line:

A must be a full wavelength long
B must be an odd number of quarter-wavelengths
C must be an even number of half-wavelengths
D will have no effect on the matching

B-006-006-010 **(A)**

Why is an antenna tuner (external or internal) frequently used with modern solid-state transceivers?

A It enables the transceivers to deliver rated power to a mismatched antenna system
B It reduces losses in the line to the antenna
C It reduces common-mode noise pickup
D It absorbs the reflected energy from a mismatched antenna system

B-006-006-011 **(B)**

If a transmission line with a characteristic impedance of 50 ohms feeds a folded dipole with a feed point impedance close to 300 ohms, what impedance transformation ratio is needed to match the two?

A 9:1
B 6:1
C 2:1
D 4:1

B-006-007-001 **(A)**

What does horizontal wave polarization mean?

A The electric lines of force of a radio wave are parallel to the Earth's surface
B The electric and magnetic lines of force of a radio wave are perpendicular to the Earth's surface
C The electric lines of force of a radio wave are perpendicular to the Earth's surface
D The magnetic lines of force of a radio wave are parallel to the Earth's surface

B-006-007-002 **(D)**

What does vertical wave polarization mean?

A The magnetic lines of force of a radio wave are perpendicular to the Earth's surface
B The electric and magnetic lines of force of a radio wave are parallel to the Earth's surface
C The electric lines of force of a radio wave are parallel to the Earth's surface
D The electric lines of force of a radio wave are perpendicular to the Earth's surface

B-006-007-003 **(A)**

What electromagnetic wave polarization does a Yagi antenna have when its elements are parallel to the Earth's surface?

A Horizontal
B Elliptical
C Vertical
D Circular

B-006-007-004 **(C)**

What electromagnetic wave polarization does a half-wavelength antenna have when it is perpendicular to the Earth's surface?

A Horizontal
B Elliptical
C Vertical
D Circular

B-006-007-005 **(D)**

Polarization of an antenna is determined by:

A the orientation of the electric field relative to the transmission line
B the orientation of the magnetic field relative to the Earth's surface
C the orientation of the electric field relative to the magnetic field
D the orientation of the electric field relative to the Earth's surface

B-006-007-006 **(B)**

An isotropic antenna is:

A a half-wave reference dipole
B a hypothetical point source
C an infinitely long piece of wire
D a dummy load

B-006-007-007 **(B)**

What is the three-dimensional radiation pattern of an isotropic radiator?

A A hemisphere
B A sphere
C A torus (donut shape)
D A cardioid

B-006-007-008 **(B)**

VHF signals from a mobile station using a vertical whip antenna will normally be best received using a:

A horizontal dipole antenna
B vertical ground-plane antenna
C random length of wire
D horizontal ground-plane antenna

B-006-007-009 **(B)**

A dipole antenna will emit a vertically polarized wave if it is:

A very high above ground
B mounted vertically
C mounted horizontally
D too near to the ground

B-006-007-010 **(D)**

If an electromagnetic wave leaves an antenna vertically polarized and reaches the receiving location by ground wave, what will be its final polarization?

A Oblique
B Horizontal
C Circular
D Vertical

B-006-007-011 **(A)**

Compared with a horizontal antenna, a vertical antenna will receive a vertically polarized radio wave:

A at higher strength
B at lower strength
C at about the same strength
D at a strength depending on the height above ground

B-006-008-001 **(A)**

A wire dipole has a resonant frequency of 3900 kHz. How can you change its resonant frequency to 3600 kHz?

A Make it longer
B Make it shorter
C Install it as a sloper
D Use smaller diameter wire

B-006-008-002 **(B)**

A wire dipole has a resonant frequency of 3600 kHz. How can you change its resonant frequency to 3900 kHz?

A Use larger diameter wire
B Make it shorter
C Make it longer
D Install it as a sloper

B-006-008-003 **(D)**

What is the wavelength in free space of a 25 MHz signal?

A 19 metres
B 39 metres
C 6 metres
D 12 metres

B-006-008-004 **(A)**

The velocity of propagation of radio frequency energy in free space is:

A 300 000 kilometres per second
B 200 000 kilometres per second
C 150 000 kilometres per second
D 186 000 kilometres per second

B-006-008-005 **(D)**

Adding a series inductance to an antenna would:

A increase the resonant frequency
B increase its useful bandwidth
C reduce atmospheric noise pickup
D decrease the resonant frequency

B-006-008-006 **(B)**

The resonant frequency of an antenna may be increased by:

A lengthening the radiating element
B shortening the radiating element
C lowering the radiating element
D increasing the height of the radiating element

B-006-008-007 **(D)**

The speed of a radio wave:

A is constant
B is less than half the speed of light
C varies depending on the frequency
D is the same as the speed of light

B-006-008-008 **(D)**

Why are insulators used at the ends of a suspended wire antenna?

A To decrease the effective antenna length
B To increase the antenna bandwidth
C To reduce capacitive coupling with the ground
D To limit the electrical length of the antenna

B-006-008-009 **(C)**

To lower the resonant frequency of an antenna, the operator should:

A use smaller diameter wire
B lengthen the transmission line
C lengthen it
D shorten it

B-006-008-010 **(B)**

Some antennas are constructed with traps. What is a trap?

A A hollow metal can
B A coil and capacitor in parallel
C A large wire-wound resistor
D A coil wrapped around a ferrite rod

B-006-008-011 **(A)**

What is the wavelength in free space of a 2 MHz signal?

A 150 metres
B 360 metres
C 1500 metres
D 30 metres

B-006-009-001 **(D)**

How is a parasitic antenna element energized?

A By direct connection to a driven element
B By direct connection to the transmission line
C By inductive coupling from a wave trap
D By induction or radiation from a driven element

B-006-009-002 **(C)**

How can the directivity of a half-wave dipole be increased?

A By adding traps to the radiating element
B By lengthening the radiating element
C By adding one or more parasitic elements
D By using a radiating element with a larger diameter

B-006-009-003 **(B)**

If a half-wave dipole is converted to a Yagi by adding a slightly shorter parasitic element, in what direction(s) does the radiation strength increase?

A In both directions parallel to the elements
B From the dipole towards the new element
C From the new element towards the dipole
D In both directions at right angles to the elements

B-006-009-004 **(C)**

If a half-wave dipole is converted to a Yagi by adding a slightly longer element, in what direction(s) does the radiation strength increase?

A In both directions at right angles to the elements
B In both directions parallel to the elements
C From the new element towards the dipole
D From the dipole towards the new element

B-006-009-005 **(B)**

The property of an antenna that defines the range of frequencies to which it will respond, is called its:

A antenna aperture
B bandwidth
C front-to-back ratio
D beamwidth

B-006-009-006 **(B)**

What is the approximate gain of a half-wave dipole in free space relative to an isotropic radiator?

A 1.0 dB
B 2.1 dB
C 1.5 dB
D 3.0 dB

B-006-009-007 **(C)**

What is meant by antenna gain?

A The ratio of the power radiated by an antenna compared to the transmitter power
B The power amplifier gain minus the transmission line losses
C The ratio of the radiated signal strength of an antenna to that of a reference antenna
D The ratio of the signal in the forward direction to the signal in the back direction

B-006-009-008 **(D)**

What is meant by antenna bandwidth?

A Antenna length divided by the number of elements
B The angle between the half-power radiation points
C The angle formed between two imaginary lines drawn through the ends of the elements
D The frequency range over which the antenna may be expected to perform well

B-006-009-009 **(A)**

In free space, what is the radiation pattern of a half-wave dipole?

A Maximum radiation broadside from the antenna
B Maximum radiation from the ends of the antenna
C Omnidirectional radiation pattern
D Hemispherical radiation pattern

B-006-009-010 **(D)**

The gain of an antenna, especially on VHF and above, is quoted in dBi. The "i" in this expression stands for:

A integral
B ionospheric
C interpolated
D isotropic

B-006-009-011 **(B)**

An antenna is said to have a gain of 4.1 dBi. How much gain is this over a half-wave dipole antenna?

A 1.1 dB
B 2.0 dB
C 4.1 dB
D 3.0 dB

B-006-010-001 **(B)**

How do you calculate the approximate length in metres of a quarter-wavelength antenna for use on frequencies below 30 MHz?

A Divide 143 by the operating frequency in MHz
B Divide 71.3 by the operating frequency in MHz
C Divide 468 by the operating frequency in MHz
D Divide 300 by the operating frequency in MHz

B-006-010-002 **(B)**

If you made a quarter-wavelength vertical antenna for 21.125 MHz, approximately how long would it be?

A 6.77 metres
B 3.37 metres
C 3.55 metres
D 7.10 metres

B-006-010-003 **(D)**

If you made a half-wavelength vertical antenna for 223 MHz, approximately how long would it be?

A 32 cm
B 105 cm
C 135 cm
D 67 cm

B-006-010-004 **(D)**

Why is a five-eighths wavelength vertical antenna better than a quarter-wavelength vertical antenna for VHF or UHF mobile operations?

A Because it has a high radiation angle
B Because it does not require impedance matching
C Because it can handle more power
D Because it has more gain

B-006-010-005 **(A)**

If a quarter-wavelength vertical antenna is placed on the roof of a car, in what direction does it send out radio energy?

A It goes out equally well in all horizontal directions
B Most of it goes vertically straight-up
C Most of it goes equally in two opposite directions
D Most of it goes in one direction

B-006-010-006 **(C)**

What is an advantage of downward sloping radials on a ground plane antenna?

A It brings the feed point impedance closer to 300 ohms
B It lowers the radiation angle
C It brings the feed point impedance closer to 50 ohms
D It increases the radiation angle

B-006-010-007 **(A)**

What configuration of radials will match an elevated quarter-wave vertical antenna to a 50-ohm coaxial cable?

A Downward sloping quarter-wave radials
B Horizontal quarter-wave radials
C Horizontal half-wave radials
D Upward sloping half-wave radials

B-006-010-008 **(D)**

Which of the following transmission lines will give the best match to the base of a quarter-wave ground-plane antenna?

A 300-ohm balanced transmission line
B 75-ohm balanced transmission line
C 75-ohm coaxial cable
D 50-ohm coaxial cable

B-006-010-009 **(D)**

How can a vertical antenna, 2 metres in length, be made to resonate in the 80-metre band for mobile use?

A Use a solid radiating element instead of tubing
B Install a capacitor in series with the antenna
C Connect the transmission line shield to the vehicle's chassis
D Install an inductor in series with the antenna

B-006-010-010 **(C)**

Why is a loading coil often used with an HF mobile vertical antenna?

A To lower the Q
B To filter out electrical noise
C To tune out capacitive reactance
D To lower the losses

B-006-010-011 **(C)**

When using a ground mounted vertical HF antenna, what can you do to reduce ground losses?

A Improve the impedance match at the base
B Raise the antenna one eighth of a wavelength
C Install a wire ground system (radials) at the antenna base
D Use an insulator with a higher breakdown voltage

B-006-011-001 **(A)**

What design feature allows a single Yagi antenna to function on the 20-metre, 15-metre and 10-metre bands?

A Element traps
B Large diameter elements
C Multiple reflector elements
D T-match feed circuit

B-006-011-002 **(A)**

What is the approximate length of the driven element of a Yagi antenna for 14.0 MHz?

A 10.21 metres
B 5.09 metres
C 10.71 metres
D 21.43 metres

B-006-011-003 **(C)**

What is the approximate length of the director element of a Yagi antenna for 21.1 MHz?

A 3.38 metres
B 3.55 metres
C 6.44 metres
D 7.11 metres

B-006-011-004 **(C)**

What is the approximate length of the reflector element of a Yagi antenna for 28.1 MHz?

A 2.54 metres
B 2.67 metres
C 5.34 metres
D 10.68 metres

B-006-011-005 **(A)**

What is one effect of increasing the boom length and adding directors to a Yagi antenna?

A Gain increases
B Front-to-back ratio increases
C Beamwidth increases
D Power handling capability increases

B-006-011-006 **(D)**

What is the major advantage of increasing element spacing on a Yagi antenna?

A Better front-to-back ratio
B Lower feed point impedance
C Wider bandwidth
D Higher gain

B-006-011-007 **(C)**

Why are Yagi antennas often used on HF bands from 20 metres to 10 metres?

A Their wide bandwidth provides a good match over an entire band
B Their high angle of radiation facilitates long-range communications
C Rotatable high-gain antennas become feasible due to shorter element lengths
D Excellent omnidirectional coverage in the horizontal plane

B-006-011-008 **(A)**

What does "antenna front-to-back ratio" mean in reference to a Yagi antenna?

A The ratio of the power radiated in the forward direction to the power radiated in the opposite direction
B The ratio of the power radiated by the director element, to the power radiated by the reflector element
C The ratio of the length of the director element, to the length of the reflector element
D The ratio of the driven element-to-director spacing, to the driven element-to-reflector spacing

B-006-011-009 **(D)**

How can the bandwidth of a Yagi antenna be increased?

A Decrease the element spacing
B Install loading coils in the elements
C Use tapered elements
D Increase the diameter of the elements

B-006-011-010 **(D)**

For a three-element Yagi antenna, what approximate element spacing (in wavelengths) provides the best compromise between gain and front-to-back ratio?

A 0.10
B 0.50
C 0.75
D 0.20

B-006-011-011 **(A)**

If the forward gain of a six-element Yagi is about 10 dBi, what would the gain of two of these antennas be if they were "stacked"?

A 13 dBi
B 7 dBi
C 20 dBi
D 10 dBi

B-006-012-001 **(A)**

If you made a half-wavelength dipole antenna for 28.150 MHz, approximately how long would it be?

A 5.08 metres
B 5.33 metres
C 10.66 metres
D 2.53 metres

B-006-012-002 **(B)**

What is one disadvantage of a random wire antenna?

A It must be installed in a straight line, without bends
B You may experience RF feedback in your station
C It usually produces vertically polarized radiation
D It must be longer than 1 wavelength

B-006-012-003 **(B)**

What is the three-dimensional radiation pattern of a half-wavelength dipole in free space?

A Major lobes at 45-degree angles to the antenna
B A torus (donut shape) around the antenna
C A major lobe off each end of the antenna
D Spherical (equal radiation in all directions)

B-006-012-004 **(D)**

What is the impedance at the feed point of a half-wave dipole in free space?

A 52 ohms
B 300 ohms
C 450 ohms
D 73 ohms

B-006-012-005 **(A)**

Ignoring ground effects, what is the radiation pattern of a horizontal half-wave dipole installed with the ends pointing North/South?

A Radiates mostly to the East and West
B Radiates mostly to the South and North
C Radiates mostly to the South
D Radiates equally in all directions

B-006-012-006 **(C)**

What is a major advantage of an end-fed half-wave antenna (EFHW)?

A High resistance to local noise pickup
B Develops minimal common-mode current
C Capable of multi-band operation
D Matching network not needed to feed with coaxial cable

B-006-012-007 **(A)**

What is a disadvantage of using an antenna equipped with traps?

A It may radiate harmonics more readily
B It is too sharply directional at lower frequencies
C It picks up more noise than a simple dipole
D It can only be used for one band

B-006-012-008 **(D)**

What is an advantage of using a trap antenna?

A It has high directivity at the higher frequencies
B It has high gain
C It minimizes harmonic radiation
D It may be used for multi-band operation

B-006-012-009 **(D)**

If you were to cut a half-wave dipole for 3.75 MHz, what would be its approximate length?

A 40.00 metres
B 62.40 metres
C 80.00 metres
D 38.13 metres

B-006-013-001 **(D)**

What is a quad antenna?

A A centre-fed half-wavelength long wire
B A quarter-wavelength vertical conductor fed at the bottom
C Four straight, parallel elements in line with each other, each approximately a half-wavelength long
D Two or more parallel four-sided wire loops, each approximately one wavelength long

B-006-013-002 **(D)**

What is a delta loop antenna with parasitic elements?

A An antenna made of a large multi-turn triangular loop
B An antenna system made of three vertical antennas, arranged in a triangular shape
C An antenna made from several triangular coils of wire on an insulating form
D An antenna consisting of multiple elements, each a triangular loop whose total length is approximately one wavelength

B-006-013-003 **(C)**

What is the approximate length of the driven element of a quad antenna designed for 21.4 MHz?

A 10.93 metres
B 3.57 metres
C 14.30 metres
D 7.01 metres

B-006-013-004 **(B)**

What is the approximate length of the driven element of a quad antenna designed for 14.3 MHz?

A 5.35 metres
B 21.40 metres
C 10.49 metres
D 16.36 metres

B-006-013-005 **(A)**

What is the approximate length of a delta loop antenna designed for 28.7 MHz?

A 10.66 metres
B 3.55 metres
C 8.15 metres
D 4.98 metres

B-006-013-006 **(C)**

What is a major disadvantage of a quad antenna, as compared to a Yagi antenna with the same number of elements and boom length?

A Lower gain
B Requires matching to the transmission line
C More susceptible to weather damage
D Requires a more heavy-duty mast or tower

B-006-013-007 **(B)**

You are constructing an HF delta loop antenna. It is oriented with the bottom element parallel to the ground. Where should you locate the feed point for horizontal polarization?

A On a side element, one quarter wavelength from the top
B In the centre of the bottom element
C In the centre of a side element
D At a junction of the bottom element and a side element

B-006-013-008 **(C)**

Moving the feed point of a quad antenna from a side parallel to the ground to a side perpendicular to the ground will have what effect?

A It will significantly decrease the antenna feed point impedance
B It will significantly increase the antenna feed point impedance
C It will change the antenna polarization from horizontal to vertical
D It will change the antenna polarization from vertical to horizontal

B-006-013-009 **(D)**

What is the approximate length of the wire for a horizontal loop tuned at 7.15 MHz?

A 41.96 metres
B 10.49 metres
C 20.00 metres
D 42.80 metres

B-006-013-010 **(A)**

The quad antenna consists of two or more square loops of wire. The driven element has an approximate overall length of:

A one wavelength
B three quarters of a wavelength
C two wavelengths
D one half wavelength

B-006-013-011 **(A)**

What is the approximate overall length of a delta loop antenna?

A One wavelength
B One quarter of a wavelength
C Two wavelengths
D One half of a wavelength

B-007-001-001 **(B)**

What type of wave propagation usually occurs between two nearby VHF transceivers?

A Auroral
B Line-of-sight
C Ducting
D Ionospheric

B-007-001-002 **(B)**

What does near vertical incidence sky-wave (NVIS) propagation enable?

A Continent-wide communications
B Medium range HF communications, especially in difficult terrain
C Multi-hop HF worldwide communications
D Regional communications above the critical frequency

B-007-001-003 **(A)**

When a signal is returned to Earth by the ionosphere, what is this called?

A Sky-wave propagation
B Tropospheric propagation
C Ground-wave propagation
D Earth-Moon-Earth propagation

B-007-001-004 **(A)**

On VHF and higher frequencies, why does the radio horizon extend beyond the visible horizon?

A Normal refraction in the troposphere
B Ionization in the troposphere
C Diffraction caused by soil conductivity
D Refraction in the D-region

B-007-001-005 **(C)**

What type of wave is commonly known as sky wave?

A Scattered wave
B Space wave
C Ionospheric wave
D Tropospheric wave

B-007-001-006 **(D)**

What portion of a radio signal is directly affected by the surface of the Earth?

A Tropospheric wave
B Ionospheric wave
C Scattered wave
D Ground wave

B-007-001-007 **(D)**

What makes radiocommunication out to 200 km possible at lower HF frequencies during the daytime?

A Tropospheric ducting
B Skip wave
C Space wave
D Ground wave

B-007-001-008 **(D)**

Considering the bands from 160 metres to 6 metres, which band offers the greatest ground-wave propagation distance?

A 40 metres
B 10 metres
C 6 metres
D 160 metres

B-007-001-009 **(B)**

What type of radio wave follows a path from the transmitter to the ionosphere and back to Earth?

A Plane wave
B Sky wave
C Direct wave
D Scattered wave

B-007-001-010 **(C)**

Reception of high frequency (HF) radio waves beyond 4000 km is generally made possible by:

A scattered wave
B space wave
C ionospheric wave
D ground wave

B-007-002-001 **(A)**

What causes the ionosphere to form?

A Solar radiation ionizing the outer atmosphere
B Lightning ionizing the outer atmosphere
C Release of fluorocarbons into the atmosphere
D Temperature changes ionizing the outer atmosphere

B-007-002-002 **(B)**

What type of solar radiation is most responsible for ionization in the outer atmosphere?

A Infrared
B Ultraviolet
C Microwave
D Ionized particles

B-007-002-003 **(C)**

Which ionospheric region is closest to the Earth?

A The F region
B The A region
C The D region
D The E region

B-007-002-004 **(D)**

Which region of the ionosphere is the least useful for long-distance radio-wave propagation?

A The F2 region
B The F1 region
C The E region
D The D region

B-007-002-005 **(C)**

Which region of the ionosphere separates into two sub-regions in the daytime?

A The D region
B The G region
C The F region
D The E region

B-007-002-006 **(C)**

When is the ionosphere most ionized?

A Midnight
B Dusk
C Midday
D Dawn

B-007-002-007 **(B)**

When is ionization at a minimum in the ionosphere?

A Shortly before midnight
B Shortly before dawn
C Just after noon
D Just after dusk

B-007-002-008 **(A)**

Why is the F2 region mainly responsible for the longest distance radio-wave propagation?

A Because it is the highest ionospheric region
B Because it exists only at night
C Because it is the lowest ionospheric region
D Because it does not absorb radio waves as much as other ionospheric regions

B-007-002-009 **(D)**

What is the main reason the 160-metre and 80-metre bands tend to be useful only for short-distance communications during daylight hours?

A Because of signal scattering
B Because of E region ionization
C Because of E region absorption
D Because of D region absorption

B-007-002-010 **(D)**

During the day, what two sub-regions appear in the ionosphere?

A D1 and D2
B E1 and E2
C B1 and B2
D F1 and F2

B-007-002-011 **(A)**

What is the position of the E region in the ionosphere?

A Below the F region
B Below the D region
C Above the C region
D Above the F region

B-007-003-001 **(B)**

What term describes an area that is too distant for reception of ground waves, but too close for reception of ionospheric waves?

A Propagation zone
B Skip zone
C Shadow zone
D Scatter zone

B-007-003-002 **(B)**

What is the maximum distance along the Earth's surface that is normally covered in one hop using the F2 region?

A 300 km
B 4 000 km
C 12 000 km
D 2 000 km

B-007-003-003 **(D)**

What is the maximum distance along the Earth's surface that is normally covered in one hop using the E region?

A 300 km
B 4000 km
C 1000 km
D 2000 km

B-007-003-004 **(B)**

Skip zone is:

A a zone between the antenna and the return of the first refracted wave
B a zone between the end of the ground wave and the point where the first ionosphere-refracted wave returns to Earth
C a zone of silence caused by lost sky waves
D a zone between any two refracted waves

B-007-003-005 **(C)**

The distance to Europe from your location is approximately 5000 km. What type of high frequency (HF) propagation is the most likely to work?

A Back scatter
B Tropospheric scatter
C Multi-hop
D Sporadic "E"

B-007-003-006 **(A)**

Assuming constant ionosphere region height, how does a higher radiation angle affect skip distance?

A It decreases, due to the geometry of the signal path
B It decreases, due to the decrease in critical frequency
C It increases, due to the geometry of the signal path
D It increases, due to the increase in critical frequency

B-007-003-007 **(D)**

On a double-hop path involving the surface of the Earth as a middle point, what phenomenon returns the radio wave to the ionosphere?

A Refraction
B Diffraction
C Scattering
D Reflection

B-007-003-008 **(B)**

Skip distance is the:

A maximum distance a signal will travel by both a ground wave and reflected wave
B minimum distance reached by a signal after one reflection by the ionosphere
C maximum distance reached by a signal after one reflection by the ionosphere
D minimum distance reached by a ground-wave signal

B-007-003-009 **(A)**

Skip is a term associated with signals from the ionosphere. What causes skip?

A Refraction by the ionosphere
B Selective fading of local signals
C High gain antennas are being used
D Local cloud cover

B-007-003-010 **(B)**

The skip distance of a sky wave will be greatest when the:

A signal given out is strongest
B angle between the ground and the emitted radiation is smallest
C polarization is vertical
D ionosphere is most densely ionized

B-007-003-011 **(C)**

How does an increase in the height of the refracting region affect skip distance?

A It decreases, due to the geometry of the signal path
B It decreases, due to the increase in critical frequency
C It increases, due to the geometry of the signal path
D It increases, due to the increase in critical frequency

B-007-004-001 **(D)**

What effect does the D region of the ionosphere have on lower frequency HF waves in the daytime?

A It bends the radio waves out into space
B It refracts the radio waves back to Earth
C It distorts the waves
D It absorbs the waves

B-007-004-002 **(C)**

Why can you not hear distant 160-metre and AM broadcast stations during daytime hours?

A The splitting of the F region into two sub-regions
B The weather below the ionosphere
C The ionization of the D region
D The presence of ionized clouds in the E region

B-007-004-003 **(D)**

A radio transmission may follow two or more different paths during propagation, and this may result in phase differences at the receiver. What is the effect at the receiver?

A Wavering
B Absorption
C Intermodulation
D Fading

B-007-004-004 **(D)**

While using a 2-metre hand-held transceiver in an urban setting, you notice that moving less than one metre can severely attenuate your received signal. What is the likely cause?

A Overhead power lines create a Faraday cage
B Underground conduits change ground conductivity
C Passing vehicles absorb the radio signals
D Signals arriving on different paths cancel one another

B-007-004-005 **(B)**

A transmitted radio signal reaches a receiver by both one-hop and two-hop skip paths. What can small changes in the ionosphere cause?

A A shift in signal frequency
B Variations in signal strength
C Consistently weaker signals
D Consistently stronger signals

B-007-004-006 **(D)**

What can be done to continue HF communications during a sudden ionospheric disturbance (SID)?

A Try the other sideband
B Try a different antenna polarization
C Try a different frequency shift
D Try a higher frequency band

B-007-004-007 **(A)**

On the VHF and UHF bands, the polarization of the receiving antenna in relation to the transmitting antenna is very important, yet on HF bands it is relatively unimportant. Why is that so?

A The refraction in the ionosphere changes the wave's polarization
B The polarization of ground waves and ionospheric waves continually varies
C The refraction forces the wave's polarization to vertical
D The polarization of ionospheric waves varies depending on the entry angle into the refracting region

B-007-004-008 **(B)**

What causes selective fading?

A Large changes in the height of the ionosphere at the receiving station ordinarily occurring shortly before sunrise and sunset
B Phase differences between radio wave components of the same transmission, as experienced at the receiving station
C Small changes in directional antenna heading at the receiving station
D Time differences between the receiving and transmitting stations

B-007-004-009 **(B)**

How does the bandwidth of a transmitted signal affect selective fading?

A It is more pronounced at narrow bandwidths
B It is more pronounced at wide bandwidths
C It is the same for both wide and narrow bandwidths
D Only the receiver bandwidth determines the selective fading effect

B-007-004-010 **(D)**

What effect do refraction, reflection and Faraday rotation have on a radio wave?

A Increase the speed of propagation
B Increase the occupied bandwidth
C Change the wavelength
D Change the polarization

B-007-004-011 **(D)**

If a radio transmission follows two or more different paths during propagation, the received signal may degrade due to fading. What other type of degradation can occur?

A Frequency shift
B Heterodyne squeal
C Higher noise floor
D Phase-shift distortion

B-007-005-001 **(D)**

How do sunspots change the ionization of the atmosphere?

A The more sunspots there are, the lesser the ionization
B Unless there are sunspots, the ionization is zero
C They have no effect
D The more sunspots there are, the greater the ionization

B-007-005-002 **(B)**

How long is an average sunspot cycle?

A 7 years
B 11 years
C 17 years
D 5 years

B-007-005-003 **(C)**

What is solar flux?

A The number of sunspots on the side of the sun facing the Earth
B The density of the sun's magnetic field
C The radio frequency energy emitted by the sun
D A measure of the tilt of the Earth's ionosphere on the side toward the sun

B-007-005-004 **(B)**

What is the solar-flux index?

A A measure of solar activity that is taken annually
B A measure of solar activity that is taken at a specific frequency
C Another name for the smoothed sunspot number (SSN)
D A measure of solar activity that compares daily readings with results from the last six months

B-007-005-005 **(C)**

What influences all radiocommunication beyond ground wave or line-of-sight ranges?

A The F1 region of the ionosphere
B Lunar tidal effects
C Solar radiation
D The F2 region of the ionosphere

B-007-005-006 **(B)**

What effect of the sun's activity influences ionospheric propagation on a daily basis?

A Coronal mass ejections (CME)
B Electromagnetic and particle radiation
C Solar wind
D Infrared radiation

B-007-005-007 **(A)**

When sunspot numbers are high, how is propagation affected?

A Frequencies up to 40 MHz or even higher become usable for long-distance communication
B High frequency radio signals are absorbed
C Frequencies up to 100 MHz or higher are normally usable for long-distance communication
D High frequency radio signals become weak and distorted

B-007-005-008 **(C)**

All communication frequencies throughout the spectrum are affected in varying degrees by:

A auroras
B meteor showers
C the sun
D the ionosphere

B-007-005-009 **(D)**

Average duration of a solar cycle is:

A 3 years
B 6 years
C 1 year
D 11 years

B-007-005-010 **(D)**

The ability of the ionosphere to refract high frequency radio signals depends on:

A the power of the transmitted signal
B the receiver sensitivity
C upper atmosphere weather conditions
D the amount of solar radiation

B-007-005-011 **(C)**

What is the major cause of cyclical changes in HF propagation?

A Jet stream cycle
B Auroral cycle
C Solar cycle
D Magnetic pole drift cycle

B-007-006-001 **(A)**

Observatories probe the ionosphere at vertical incidence. What term describes the highest frequency that a region can reflect at the time?

A Critical frequency
B Maximum usable frequency
C Optimum working frequency
D Doppler frequency

B-007-006-002 **(D)**

What causes the maximum usable frequency to vary?

A The temperature of the ionosphere
B The speed of the winds in the upper atmosphere
C The type of weather just below the ionosphere
D The amount of radiation received from the sun

B-007-006-003 **(B)**

What does maximum usable frequency mean?

A The lowest frequency that is most absorbed by the ionosphere
B The highest frequency at which a signal will reach a given destination
C The lowest frequency at which a signal will reach a given destination
D The highest frequency that is most absorbed by the ionosphere

B-007-006-004 **(C)**

Why is communication possible between two continents at a frequency above the local critical frequency?

A Ionization is not uniform around the globe
B A higher frequency cuts through absorption more easily
C The signal enters the ionosphere at an oblique (inclined) angle
D The sun's relative position differs between the two locations

B-007-006-005 **(D)**

What is one way to determine if the maximum usable frequency (MUF) is high enough to support 28 MHz propagation between your station and western Europe?

A Listen for 20-metre beacon stations
B Listen for 31-metre broadcast stations
C Listen for WWVH time signals on 15 MHz
D Listen for 10-metre beacon stations

B-007-006-006 **(B)**

What usually happens to radio waves with frequencies below the maximum usable frequency (MUF) when they are sent into the ionosphere?

A They pass through the ionosphere
B They are bent back to the Earth
C They are changed to a frequency above the MUF
D They are completely absorbed by the ionosphere

B-007-006-007 **(D)**

At what point in the solar cycle does the 20-metre band usually support worldwide propagation during daylight hours?

A Only at the minimum point of the solar cycle
B Only at the maximum point of the solar cycle
C At the beginning of the solar cycle
D At any point in the solar cycle

B-007-006-008 **(B)**

What happens daily when the solar UV radiation increases?

A Weather in the ionosphere changes
B The maximum usable frequency increases
C The atmospheric noise level decreases
D Ground wave propagation decreases

B-007-006-009 **(A)**

When is propagation on the 80-metre band generally the LEAST effective?

A Daytime in summer
B Evening in winter
C Evening in summer
D Daytime in winter

B-007-006-010 **(A)**

The optimum working frequency provides the best long-range HF communication. Compared with the maximum usable frequency (MUF), it is usually:

A slightly lower
B double the MUF
C half the MUF
D slightly higher

B-007-006-011 **(B)**

During summer daytime, which bands are the most difficult for communications beyond ground wave?

A 20 metres
B 160 metres and 80 metres
C 40 metres
D 30 metres

B-007-007-001 **(D)**

Which ionospheric region most affects sky-wave propagation on the 6-metre band?

A The F2 region
B The F1 region
C The D region
D The E region

B-007-007-002 **(D)**

What effect does tropospheric bending have on 2-metre radio waves?

A It causes them to travel shorter distances
B It distorts the signal
C It interferes with short-range communications
D It lets you contact stations farther away

B-007-007-003 **(B)**

What causes tropospheric ducting of radio waves?

A A very low-pressure area
B A temperature inversion
C Lightning between the transmitting and receiving stations
D An aurora to the north

B-007-007-004 **(D)**

What term describes that portion of a transmitted wave kept close to the Earth's surface due to bending in the atmosphere?

A Scattered wave
B Ground wave
C Ionospheric wave
D Tropospheric wave

B-007-007-005 **(C)**

What is a sporadic-E condition?

A Variations in E-region height caused by sunspot variations
B A brief decrease in VHF signals caused by sunspot variations
C Patches of dense ionization at E-region height
D Occasional duct formation in the E region

B-007-007-006 **(D)**

On which amateur radio band is the extended-distance propagation effect of sporadic-E most often observed?

A 160 metres
B 20 metres
C 2 metres
D 6 metres

B-007-007-007 **(B)**

In the northern hemisphere, in which direction should a directional antenna be pointed to take maximum advantage of auroral propagation?

A South
B North
C East
D West

B-007-007-008 **(A)**

Where in the ionosphere does auroral activity occur?

A At E-region height
B At F-region height
C In the equatorial band
D At D-region height

B-007-007-009 **(D)**

Which analog emission mode is the most reliable in auroral propagation?

A CW, because it resists fading
B FM, because it is readable even when distorted
C FM, because it resists fading
D CW, because it is readable even when distorted

B-007-007-010 **(B)**

Excluding enhanced propagation modes, what is the approximate range of normal VHF tropospheric propagation?

A 1600 km
B 800 km
C 2400 km
D 3200 km

B-007-007-011 **(B)**

What effect is responsible for propagating a VHF signal over 800 km?

A Ionospheric refraction
B Tropospheric ducting
C Faraday rotation
D D-region refraction

B-007-008-001 **(C)**

What kind of unusual HF propagation allows weak signals from the skip zone to be heard?

A Ducting
B Ground wave
C Scatter-mode
D Sky-wave with low radiation angle

B-007-008-002 **(D)**

If you receive a weak, distorted signal close to the maximum usable frequency, what type of propagation is probably occurring?

A Ground wave
B Line-of-sight
C Ducting
D Scatter

B-007-008-003 **(D)**

What type of VHF/UHF propagation depends upon small variations in density and water-vapour content?

A Tropospheric ducting
B Ionospheric scatter
C Sporadic-E
D Tropospheric scatter

B-007-008-004 **(D)**

What makes HF scatter signals often sound distorted?

A Auroral activity and changes in the Earth's magnetic field
B Propagation through ground waves that absorb much of the signal
C The state of the E-region at the point of refraction
D Energy scattered into the skip zone through several radio-wave paths

B-007-008-005 **(A)**

Why are HF scatter signals usually weak?

A Only a small part of the signal energy is scattered into the skip zone
B Propagation through ground waves absorbs most of the signal energy
C The F region of the ionosphere absorbs most of the signal energy
D Auroral activity absorbs most of the signal energy

B-007-008-006 **(D)**

What type of propagation may allow a weak high frequency (HF) signal to be heard at a distance too far for ground-wave propagation but too near for normal sky-wave propagation?

A Short-path skip
B Sporadic-E skip
C Tropospheric scatter
D Scatter

B-007-008-007 **(A)**

On the HF bands, when is scatter propagation most likely involved?

A When you receive weak and distorted signals near the maximum usable frequency (MUF)
B When the sunspot cycle is at a minimum and D-region absorption is high
C At night when propagation is poor
D When the F1 and F2 regions are combined

B-007-008-008 **(D)**

Tropospheric scatter frequently explains VHF/UHF communications well beyond the radio horizon. What makes this propagation mode possible?

A Ionized patches in the troposphere
B Increased daytime ionization of the D region
C Local cloud cover
D Small variations in the properties of the lower atmosphere

B-007-008-009 **(D)**

Meteor scatter is most effective on what band?

A 40 metres
B 15 metres
C 160 metres
D 6 metres

B-007-008-010 **(C)**

What is the effect of scattering on a radio wave?

A A portion of the wave abruptly changes direction
B The wave is absorbed by the medium
C The wave gets redirected in many directions
D The wave is gradually bent

B-007-008-011 **(D)**

In which frequency range is meteor scatter most effective for extended-range communication?

A 10 MHz to 30 MHz
B 3 MHz to 10 MHz
C 100 MHz to 150 MHz
D 30 MHz to 100 MHz

B-008-001-001 **(B)**

What is the cause of receiver overload?

A Overmodulation of a transmitter
B Very strong signal from a transmitter
C Frequency instability of a transmitter
D Parasitic oscillations in a transmitter

B-008-001-002 **(D)**

What is one way to tell if your HF transmitter causes front-end overload interference to a neighbour's receiver?

A Adding receiver shielding has no effect
B Interference is heard regardless of the volume setting on the receiver
C Adding a low-pass filter at the transmitter solves the problem
D Transmitting on various frequencies produces similar interference

B-008-001-003 **(B)**

If a neighbour reports television interference whenever you transmit, no matter what band you use, what is probably the cause of the interference?

A Deficient harmonic suppression
B Receiver overload
C Incorrect antenna length
D Spurious emissions

B-008-001-004 **(A)**

What type of filter should be connected to a TV receiver as the first step in trying to prevent receiver overload from an amateur radio HF transmission?

A High-pass
B Low-pass
C Band-pass
D AC line filter

B-008-001-005 **(A)**

During a club Field Day outing, reception on the 20-metre SSB station is compromised every time the 20-metre CW station is on the air. What might cause such interference?

A Receiver desensitization
B Both stations are fed from the same generator
C Improper station grounding
D Harmonic emission

B-008-001-006 **(B)**

The signals from two commercial transmitters combine outside your receiver to produce noise on a desired frequency. What type of interference is this?

A Harmonic emissions
B Intermodulation
C Spurious emissions
D Receiver overload

B-008-001-007 **(B)**

You have connected your hand-held VHF transceiver to an outside gain antenna. You now hear a mixture of signals together with different modulation on your desired frequency. What is the nature of this interference?

A Audio stage intermodulation
B Receiver intermodulation
C Harmonics from other stations
D Audio stage overload

B-008-001-008 **(A)**

Two or more strong signals mix in your receiver to produce interference on a desired frequency. What is this called?

A Intermodulation interference
B Harmonic interference
C Capture effect
D Front-end desensitization

B-008-001-009 **(A)**

Two mobile stations are communicating through a repeater. As they arrive in close proximity to each other, they begin to have difficulty communicating. What is the most likely cause?

A Transmitter signals are desensitizing the receivers
B CTCSS tones are activating the receivers' squelch circuits
C They have entered a null area of their antenna patterns
D Transmitter signals are mixing with the repeater signal to cause intermodulation

B-008-001-010 **(D)**

A television receiver suffers interference on channel 5 (76 MHz - 82 MHz) only when you transmit on 14 MHz. From your home you see the tower of a commercial FM station known to broadcast on 92.5 MHz. Which of these solutions would you try first?

A Insert a low-pass filter at the HF transmitter
B Insert a high-pass filter at the HF transmitter
C Insert a low-pass filter at the television receiver
D Insert a high-pass filter at the television receiver

B-008-001-011 **(C)**

You are experiencing interference in your VHF receiver. You have determined that signals from two nearby transmitters are mixing in your receiver to cause the interference. What device can you install to reduce the interference?

A RF attenuator
B Narrow band IF filter
C Suitable filter at the receiver
D Common-mode choke

B-008-002-001 **(C)**

What devices would you install to reduce or eliminate interference to a home entertainment system from an HF transmitter?

A Metal oxide varistors
B Bypass inductors
C Coils on ferrite cores
D Bypass resistors

B-008-002-002 **(B)**

What should be done if a properly operating amateur radio station is the cause of interference to a nearby telephone?

A Make internal adjustments to the telephone equipment
B Install a modular plug-in telephone RFI filter close to the telephone device
C Ground and shield the telephone distribution amplifier
D Stop transmitting whenever the telephone is in use

B-008-002-003 **(D)**

What sound is heard from a public address system if audio rectification of a nearby single-sideband transmission occurs?

A Clearly audible speech from the transmitter's signals
B On-and-off humming or clicking
C A steady hum
D Distorted speech from the transmitter's signals

B-008-002-004 **(D)**

What sound is heard from a public address system if audio rectification of a nearby CW transmission occurs?

A Audible, possibly distorted speech
B Muffled, severely distorted speech
C A steady whistling
D On-and-off humming or clicking

B-008-002-005 **(B)**

If an amateur radio transmission is heard in a device that contains no RF components, what type of interference is this?

A Intermodulation
B Audio rectification
C Front-end overload
D Splatter

B-008-002-006 **(A)**

An amateur radio transmitter is being heard across the entire dial of a broadcast receiver. The receiver is most probably suffering from:

A audio rectification
B harmonics interference
C poor image rejection
D splatter from the transmitter

B-008-002-007 **(B)**

Your SSB HF transmissions are heard muffled on a sound system in the living room regardless of its volume setting. What causes this?

A Lack of receiver selectivity
B Audio rectification of strong signals
C Harmonics generated at the transmitter
D Improper filtering in the transmitter

B-008-002-008 **(A)**

What device can be used to minimize the effect of RF pickup by audio wires connected to stereo speakers, intercom amplifiers, telephones, etc.?

A Coil on ferrite core
B High-pass filter
C Attenuator
D Surge suppressor

B-008-002-009 **(B)**

Stereo speaker leads often act as antennas to pick up RF signals. What is one method you can use to minimize this effect?

A Connect the speakers through series capacitors
B Shorten the leads
C Lengthen the leads
D Connect the speakers through audio attenuators

B-008-002-010 **(B)**

One method of preventing RF from entering a stereo set through the speaker leads is to wrap each of the speaker leads:

A around a wooden dowel
B around a ferrite core
C around a copper bar
D around an iron bar

B-008-002-011 **(D)**

Stereo amplifiers often have long leads that pick up transmitted signals because they act as:

A parasitic elements
B resonant circuits
C frequency discriminators
D receiving antennas

B-008-003-001 **(C)**

What term describes the undesired creation of new frequency components when one or more signals enter a non-linear device?

A Linear distortion
B Aliasing
C Intermodulation
D Phase distortion

B-008-003-002 **(C)**

If someone tells you that signals from your hand-held transceiver are interfering with other signals on a frequency near yours, what could be the cause?

A Your hand-held has a chirp due to low battery voltage
B Your hand-held offset is wrong
C Your hand-held is transmitting spurious emissions
D You need to reduce your output power

B-008-003-003 **(C)**

If your transmitter sends signals outside the band where it is transmitting, what is this called?

A Transmitter chirping
B Off-frequency emissions
C Spurious emissions
D Side tones

B-008-003-004 **(D)**

What problem may occur if your transmitter is operated without its cover or other shielding in place?

A It may transmit a weak signal
B It may draw excessive current
C It may transmit a chirpy signal
D It may radiate spurious emissions

B-008-003-005 **(B)**

In Morse code transmission, local RF interference (key clicks) is produced by:

A poor wave-shaping caused by a defective filter capacitor
B the making and breaking of the circuit at the Morse key
C frequency shifting caused by poor voltage regulation
D high frequency parasitic oscillations

B-008-003-006 **(B)**

Key clicks, heard from a Morse code transmitter at a distant receiver, are the result of:

A changes in oscillator frequency on keying
B too sharp rise and decay times of the keyed carrier
C power supply hum modulating the carrier
D sparks emitting RF from the key contacts

B-008-003-007 **(C)**

In a Morse code transmission, broad bandwidth RF interference (key clicks) heard at a distance is produced by:

A sparking at the key contacts
B mechanical instability in the oscillator
C poor shaping of the waveform
D frequency shifting during keying

B-008-003-008 **(B)**

What should you do if you learn your transmitter is producing key clicks?

A Use a choke in the RF power output
B Check the keying filter and the functioning of later stages
C Adjust your key
D Regulate the oscillator supply voltage

B-008-003-009 **(B)**

What term describes an unwanted oscillation in an amplifier or oscillator circuit?

A Harmonic emission
B Parasitic oscillation
C Secondary emission
D Frequency instability

B-008-003-010 **(A)**

What can cause parasitic oscillations in a stage?

A Unwanted positive feedback
B Unwanted negative feedback
C Oscillator drift
D Power supply instability

B-008-003-011 **(A)**

Transmitter RF amplifiers can generate parasitic oscillations:

A above or below the transmitter frequency
B on VHF frequencies only
C on the transmitter fundamental frequency
D on harmonics of the transmitter frequency

B-008-004-001 **(D)**

If a neighbour reports television interference on one or two channels only when you transmit on 15 metres, what is probably the cause of the interference?

A Splatter due to overmodulation
B Television receiver front-end overload
C Parasitic oscillations from your transmitter
D Harmonic emissions from your transmitter

B-008-004-002 **(D)**

What are harmonic emissions?

A Unwanted signals that are combined with a 60 Hz hum
B Unwanted signals caused by mixing with a nearby transmitter
C Signals which cause skip propagation to occur
D Unwanted signals at frequencies which are multiples of the fundamental (operating) frequency

B-008-004-003 **(D)**

Why are harmonic emissions from an amateur radio station not wanted?

A They may result in excessive power dissipation
B They may overload a nearby transmitter
C They may interfere with stations on adjacent frequencies
D They may cause interference to other stations

B-008-004-004 **(B)**

What term describes unwanted radio energy transmitted just outside the necessary bandwidth?

A Spurious emissions
B "Out-of-band" emissions
C Harmonic emissions
D Parasitic emissions

B-008-004-005 **(D)**

If you are told your station was heard on 21.375 MHz but at the time you were operating on 7.125 MHz. What is one reason that could cause this to happen?

A Your transmitter's power-supply filter choke is defective
B You were sending CW too fast
C Your transmitter's power-supply filter capacitor is defective
D Your transmitter radiates harmonic signals

B-008-004-006 **(B)**

What causes splatter interference?

A The transmitting antenna is non-resonant
B Overmodulating a transmitter
C Keying a transmitter too fast
D Unwanted feedback in an amplifier stage

B-008-004-007 **(D)**

A television tuned to channel 3 (60 MHz - 66 MHz) experiences interference when you are transmitting on the 15-metre band. Other channels are not affected. What is the most likely cause?

A No high-pass filter on the TV
B No high-pass filter at your transmitter
C Front-end overload of the TV
D Harmonic emission from your transmitter

B-008-004-008 **(D)**

What is the probable cause of "flat topping" (non-linear operation) of an amplifier in an SSB transmitter?

A Defective sideband filter
B Insufficient power supply current capacity
C Defective low-pass filter
D Excessive microphone gain

B-008-004-009 **(B)**

Which of the following may cause excessive harmonics in a transmitter?

A Internal antenna tuner malfunction
B Overdriven stages
C Use of a non-resonant antenna
D Defective driver circuit

B-008-004-010 **(C)**

An interfering signal from an HF transmitter is found to have a frequency of 56 MHz. What could be the source?

A Seventh harmonic of an 80-metre transmission
B Third harmonic of a 15-metre transmission
C Second harmonic of a 10-metre transmission
D Crystal oscillator operating on its fundamental

B-008-004-011 **(B)**

Harmonics may be produced in the RF power amplifier of a transmitter if:

A modulation is applied to a high-level stage
B excessive drive signal is applied to it
C the output tank circuit is tuned to the fundamental frequency
D the oscillator frequency is unstable

B-008-005-001 **(C)**

What is the frequency response of an ideal notch filter?

A Attenuate all frequencies except one single frequency
B Attenuate all frequencies except a range of frequencies
C Attenuate one frequency and pass all others
D Attenuate a range of frequencies and pass all others

B-008-005-002 **(D)**

A filter attenuates frequencies below its cut-off frequency of 60 MHz. What type of filter is it?

A Low-pass
B Band-pass
C Notch
D High-pass

B-008-005-003 **(A)**

What type of filter attenuates RF energy above and below a certain range of frequencies?

A Band-pass
B High-pass
C Notch
D Low-pass

B-008-005-004 **(D)**

Why should the impedance of a filter match the transmission line where it is inserted?

A To preserve the balance of the line
B To minimize noise in the receiver
C To prevent spurious emissions
D To avoid unwanted reflection

B-008-005-005 **(C)**

Listening to shortwave on a low-cost software defined receiver (SDR), you hear several stations known to operate on much higher frequencies. What type of filter could help?

A Band-pass
B Band-reject
C Low-pass
D High-pass

B-008-005-006 **(D)**

You need to install an AC line filter to reduce radio frequency noise heard in your station equipment. What type of frequency response should it have?

A High-pass
B Band-pass
C Band-reject
D Low-pass

B-008-005-007 **(C)**

A strong interfering signal is very close to your receive frequency. Which type of filter can effectively suppress it?

A Low-pass
B Band-reject
C Notch
D High-pass

B-008-005-008 **(B)**

In a Field Day operation with separate transmitters assigned to specific bands, what type of filter is needed on the receivers to minimize interference?

A Band-reject
B Band-pass
C Low-pass
D High-pass

B-008-005-009 **(C)**

A nearby high-power HF broadcast station in the 31-metre band is interfering with your reception on the 40-metre and 30-metre bands. What type of filter is needed on the receiver to minimize interference?

A Low-pass
B High-pass
C Band-reject
D Band-pass

B-008-005-010 **(D)**

Your 2-metre station suffers receiver overload from several land mobile service transmitters on adjacent bands. What type of filter could help?

A Low-pass
B High-pass
C Notch
D Band-pass

B-008-005-011 **(B)**

A filter attenuates frequencies above its cut-off frequency of 40 MHz. What type of filter is it?

A Notch

B Low-pass

C Band-pass

D High-pass