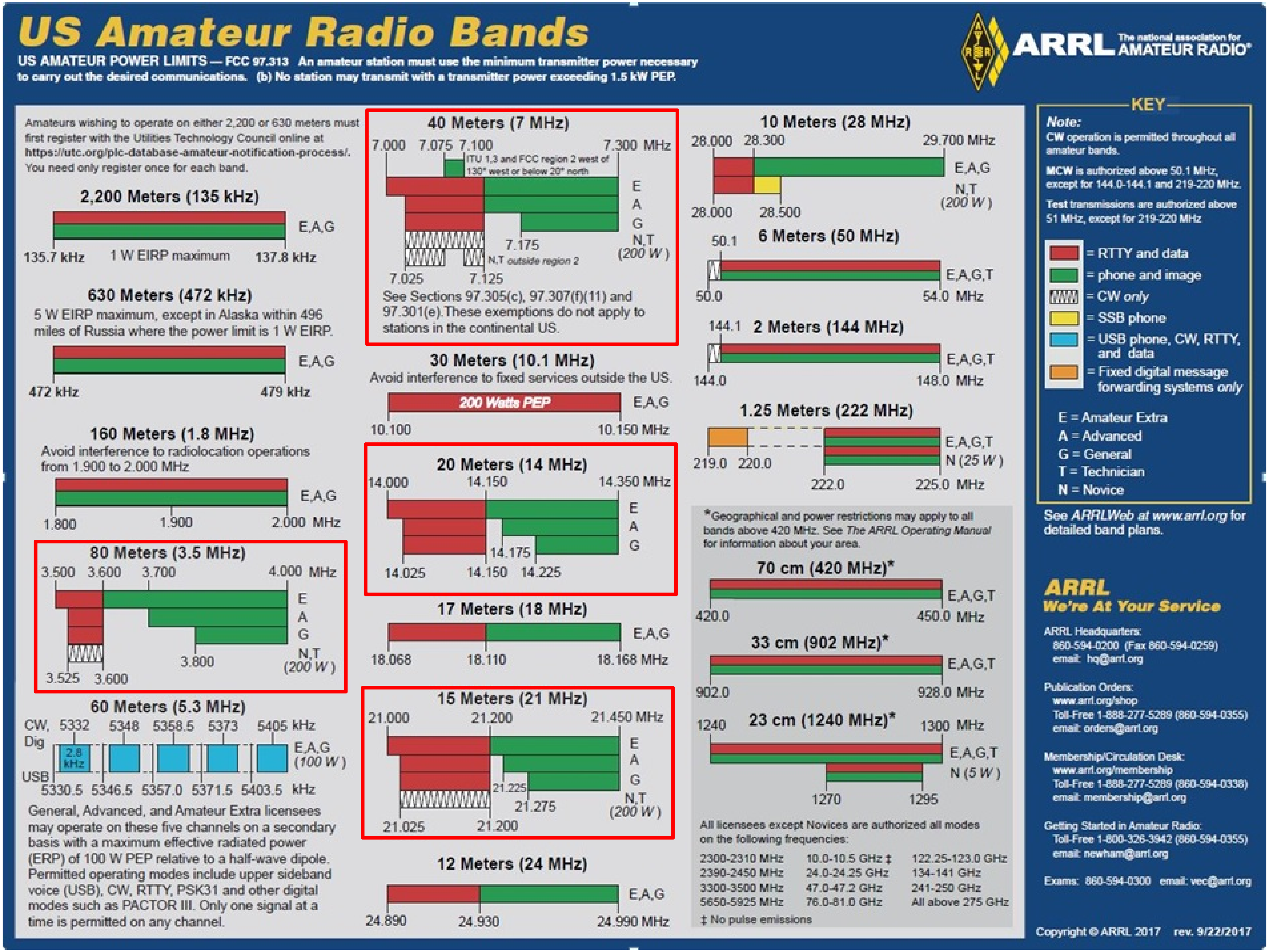
SUBELEMENT G1 – COMMISSION'S RULES
[5 Exam Questions – 5 Groups]


US Amateur Radio Bands
US AMATEUR POWER LIMITS — FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.
ARRL The national association for AMATEUR RADIO®
Amateurs wishing to operate on either 2,200 or 630 meters must first register with the Utilities Technology Council online at https://utc.org/plc-database-amateur-notification-process/. You need only register once for each band.
2,200 Meters (135 kHz)
E,A,G
135.7 kHz
1 W EIRP maximum
137.8 kHz
630 Meters (472 kHz)
5 W EIRP maximum, except in Alaska within 496 miles of Russia where the power limit is 1 W EIRP.
E,A,G
472 kHz
479 kHz
160 Meters (1.8 MHz)
Avoid interference to radiolocation operations from 1.900 to 2.000 MHz
E,A,G
1.800
1.900
2.000 MHz
80 Meters (3.5 MHz)
3.500 3.600 3.700 4.000 MHz
E
A
G
N,T (200 W)
3.800
3.525 3.600
60 Meters (5.3 MHz)
CW, Dig
5332 5348 5358.5 5373 5405 kHz
2.8 kHz
E,A,G (100 W)
USB
5330.5 5346.5 5357.0 5371.5 5403.5 kHz
General, Advanced, and Amateur Extra licensees may operate on these five channels on a secondary basis with a maximum effective radiated power (ERP) of 100 W PEP relative to a half-wave dipole. Permitted operating modes include upper sideband voice (USB), CW, RTTY, PSK31 and other digital modes such as PACTOR III. Only one signal at a time is permitted on any channel.
40 Meters (7 MHz)
7.000 7.075 7.100 7.300 MHz
ITU 1,3 and FCC region 2 west of 130° west or below 20° north
E
A
G
N,T (200 W)
7.175
N,T outside region 2
7.025 7.125
See Sections 97.305(c), 97.307(f)(11) and 97.301(e). These exemptions do not apply to stations in the continental US.
30 Meters (10.1 MHz)
Avoid interference to fixed services outside the US.
200 Watts PEP
E,A,G
10.100
10.150 MHz
20 Meters (14 MHz)
14.000 14.150 14.350 MHz
E
A
G
14.175
14.025 14.150 14.225
17 Meters (18 MHz)
E,A,G
18.068 18.110 18.168 MHz
15 Meters (21 MHz)
21.000 21.200 21.450 MHz
E
A
G
N,T (200 W)
21.225
21.275
21.025 21.200
12 Meters (24 MHz)
E,A,G
24.890 24.930 24.990 MHz
10 Meters (28 MHz)
28.000 28.300 29.700 MHz
E,A,G
N,T (200 W)
28.000 28.500
6 Meters (50 MHz)
50.1
E,A,G,T
50.0 54.0 MHz
2 Meters (144 MHz)
144.1
E,A,G,T
144.0 148.0 MHz
1.25 Meters (222 MHz)
E,A,G,T
N (25 W)
219.0 220.0
222.0 225.0 MHz
*Geographical and power restrictions may apply to all bands above 420 MHz. See The ARRL Operating Manual for information about your area.
70 cm (420 MHz)*
E,A,G,T
420.0 450.0 MHz
33 cm (902 MHz)*
E,A,G,T
902.0 928.0 MHz
23 cm (1240 MHz)*
1240 1300 MHz
E,A,G,T
N (5 W)
1270 1295
All licensees except Novices are authorized all modes on the following frequencies:
2300-2310 MHz 10.0-10.5 GHz ‡ 122.25-123.0 GHz
2390-2450 MHz 24.0-24.25 GHz 134-141 GHz
3300-3500 MHz 47.0-47.2 GHz 241-250 GHz
5650-5925 MHz 76.0-81.0 GHz All above 275 GHz
‡ No pulse emissions
KEY
Note:
CW operation is permitted throughout all amateur bands.
MCW is authorized above 50.1 MHz, except for 144.0-144.1 and 219-220 MHz.
Test transmissions are authorized above 51 MHz, except for 219-220 MHz
= RTTY and data
= phone and image
= CW only
= SSB phone
= USB phone, CW, RTTY, and data
= Fixed digital message forwarding systems only
E = Amateur Extra
A = Advanced
G = General
T = Technician
N = Novice
See ARRLWeb at www.arrl.org for detailed band plans.
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Exams: 860-594-0300 email: vec@arrl.org
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G1A01 [97.301(d)]

On which HF and/or MF amateur bands are there portions where General class licensees cannot transmit?

A. 60 meters, 30 meters, 17 meters, and 12 meters

B. 160 meters, 60 meters, 15 meters, and 12 meters

C. 80 meters, 40 meters, 20 meters, and 15 meters

D. 80 meters, 20 meters, 15 meters, and 10 meters

G1A01 (C) [97.301(d)]

On which HF and/or MF amateur bands are there portions where General class licensees cannot transmit?

A. 60 meters, 30 meters, 17 meters, and 12 meters

B. 160 meters, 60 meters, 15 meters, and 12 meters

C. 80 meters, 40 meters, 20 meters, and 15 meters

D. 80 meters, 20 meters, 15 meters, and 10 meters

G1A02 [97.305]

On which of the following bands is phone operation prohibited?

A. 160 meters

B. 30 meters

C. 17 meters

D. 12 meters

G1A02 (B) [97.305]

On which of the following bands is phone operation prohibited?

A. 160 meters

B. 30 meters

C. 17 meters

D. 12 meters

G1A03 [97.305]

On which of the following bands is image transmission prohibited?

A. 160 meters

B. 30 meters

C. 20 meters

D. 12 meters

G1A03 (B) [97.305]

On which of the following bands is image transmission prohibited?

A. 160 meters

B. 30 meters

C. 20 meters

D. 12 meters

G1A04 [97.303(h)]

Which of the following amateur bands is restricted to communication only on specific channels, rather than frequency ranges?

A. 11 meters

B. 12 meters

C. 30 meters

D. 60 meters

G1A04 (D) [97.303(h)]

Which of the following amateur bands is restricted to communication only on specific channels, rather than frequency ranges?

A. 11 meters

B. 12 meters

C. 30 meters

D. 60 meters

G1A05 [97.301(d)]

On which of the following frequencies are General class licensees prohibited from operating as control operator?

A. 7.125 MHz to 7.175 MHz

B. 28.000 MHz to 28.025 MHz

C. 21.275 MHz to 21.300 MHz

D. All of the above

G1A05 (A) [97.301(d)]

On which of the following frequencies are General class licensees prohibited from operating as control operator?

A. 7.125 MHz to 7.175 MHz

B. 28.000 MHz to 28.025 MHz

C. 21.275 MHz to 21.300 MHz

D. All of the above

G1A06 [97.303]

Which of the following applies when the FCC rules designate the amateur service as a secondary user on a band?

A. Amateur stations must record the call sign of the primary service station before operating on a frequency assigned to that station

B. Amateur stations may use the band only during emergencies

C. Amateur stations must not cause harmful interference to primary users and must accept interference from primary users

D. Amateur stations may only operate during specific hours of the day, while primary users are permitted 24- hour use of the band

G1A06 (C) [97.303]

Which of the following applies when the FCC rules designate the amateur service as a secondary user on a band?

A. Amateur stations must record the call sign of the primary service station before operating on a frequency assigned to that station

B. Amateur stations may use the band only during emergencies

C. Amateur stations must not cause harmful interference to primary users and must accept interference from primary users

D. Amateur stations may only operate during specific hours of the day, while primary users are permitted 24- hour use of the band

G1A07 [97.305(a)]

On which amateur frequencies in the 10-meter band may stations with a General class control operator transmit CW emissions?

A. 28.000 MHz to 28.025 MHz only

B. 28.000 MHz to 28.300 MHz only

C. 28.025 MHz to 28.300 MHz only

D. The entire band

G1A07 (D) [97.305(a)]

On which amateur frequencies in the 10-meter band may stations with a General class control operator transmit CW emissions?

A. 28.000 MHz to 28.025 MHz only

B. 28.000 MHz to 28.300 MHz only

C. 28.025 MHz to 28.300 MHz only

D. The entire band

G1A08 [97.301(b)]
Which HF bands have segments exclusively allocated to Amateur Extra licensees?

A. All HF bands

B. 80 meters, 40 meters, 20 meters, and 15 meters

C. All HF bands except 160 meters and 10 meters

D. 60 meters, 30 meters, 17 meters, and 12 meters

G1A08 (B) [97.301(b)]

Which HF bands have segments exclusively allocated to Amateur Extra licensees?

A. All HF bands

B. 80 meters, 40 meters, 20 meters, and 15 meters

C. All HF bands except 160 meters and 10 meters

D. 60 meters, 30 meters, 17 meters, and 12 meters

G1A09 [97.301(d)]

Which of the following frequencies is within the General class portion of the 15-meter band?

A. 14250 kHz

B. 18155 kHz

C. 21300 kHz

D. 24900 kHz

G1A09 (C) [97.301(d)]

Which of the following frequencies is within the General class portion of the 15-meter band?

A. 14250 kHz

B. 18155 kHz

C. 21300 kHz

D. 24900 kHz

G1A10 [97.205(b)]

What portion of the 10-meter band is available for repeater use?

A. The entire band

B. The portion between 28.1 MHz and 28.2 MHz

C. The portion between 28.3 MHz and 28.5 MHz

D. The portion above 29.5 MHz

G1A10 (D) [97.205(b)]

What portion of the 10-meter band is available for repeater use?

A. The entire band

B. The portion between 28.1 MHz and 28.2 MHz

C. The portion between 28.3 MHz and 28.5 MHz

D. The portion above 29.5 MHz

G1A11 [97.301]

When General class licensees are not permitted to use the entire voice portion of a band, which portion of the voice segment is available to them?

A. The lower frequency portion

B. The upper frequency portion

C. The lower frequency portion on frequencies below 7.3 MHz, and the upper portion on frequencies above 14.150 MHz

D. The upper frequency portion on frequencies below 7.3 MHz, and the lower portion on frequencies above 14.150 MHz

G1A11 (B) [97.301]

When General class licensees are not permitted to use the entire voice portion of a band, which portion of the voice segment is available to them?

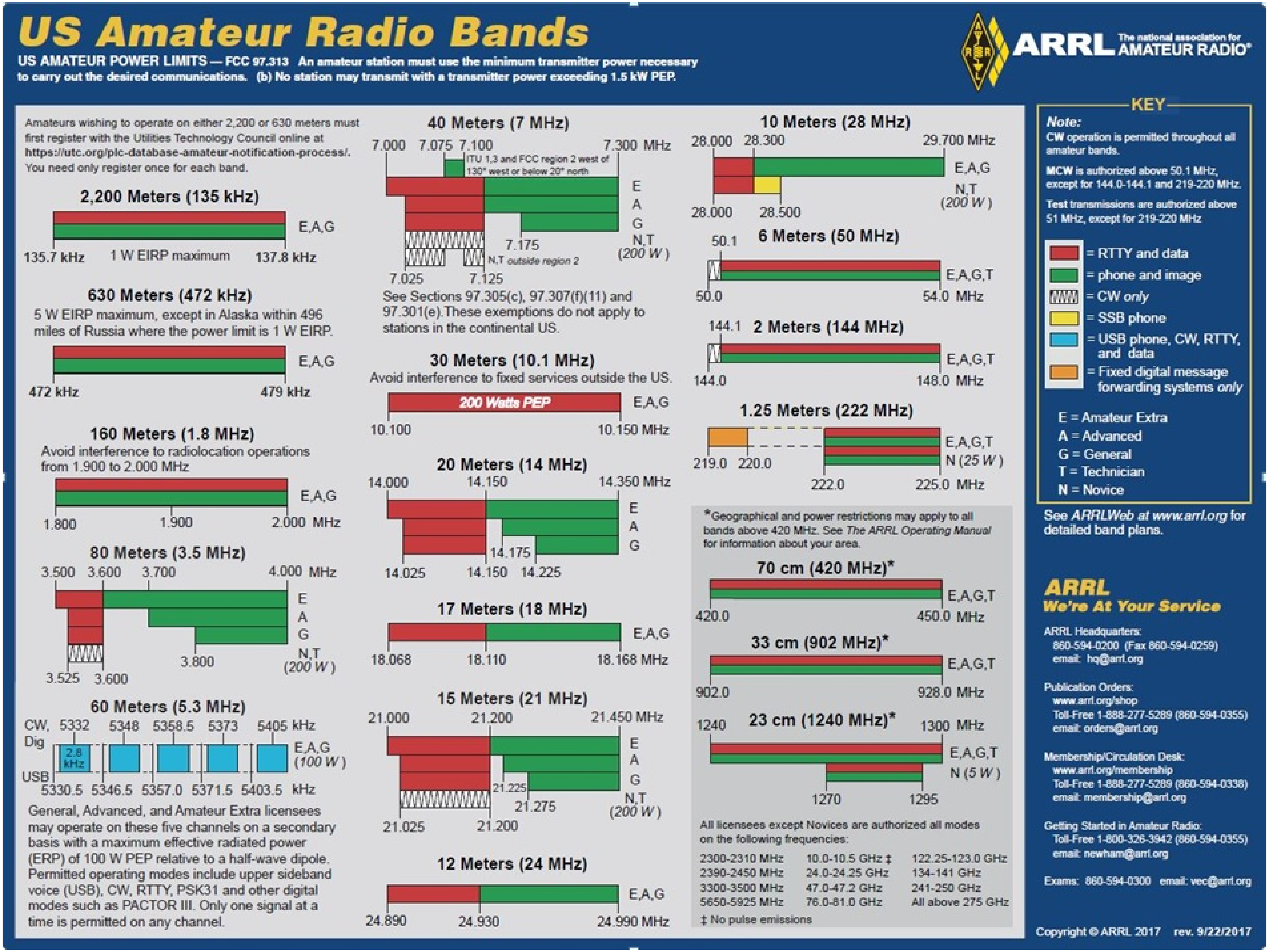
A. The lower frequency portion

B. The upper frequency portion

C. The lower frequency portion on frequencies below 7.3 MHz, and the upper portion on frequencies above 14.150 MHz

D. The upper frequency portion on frequencies below 7.3 MHz, and the lower portion on frequencies above 14.150 MHz

G1B – Antenna structure limitations; good engineering and good amateur practice; beacon operation; prohibited transmissions; retransmitting radio signals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E,A,G
135.7 kHz
1 W EIRP maximum
137.8 kHz
630 Meters (472 kHz)
5 W EIRP maximum, except in Alaska within 496 miles of Russia where the power limit is 1 W EIRP.
E,A,G
472 kHz
479 kHz
160 Meters (1.8 MHz)
Avoid interference to radiolocation operations from 1.900 to 2.000 MHz
E,A,G
1.800
1.900
2.000 MHz
80 Meters (3.5 MHz)
3.500
3.600
3.700
4.000 MHz
E
A
G
N,T
(200 W)
3.800
3.525
3.600
60 Meters (5.3 MHz)
CW, Dig
5332
5348
5358.5
5373
5405 kHz
2.8 kHz
E,A,G
(100 W)
USB
5330.5
5346.5
5357.0
5371.5
5403.5
kHz
General, Advanced, and Amateur Extra licensees may operate on these five channels on a secondary basis with a maximum effective radiated power (ERP) of 100 W PEP relative to a half-wave dipole. Permitted operating modes include upper sideband voice (USB), CW, RTTY, PSK31 and other digital modes such as PACTOR III. Only one signal at a time is permitted on any channel.
40 Meters (7 MHz)
7.000
7.075
7.100
7.300 MHz
ITU 1,3 and FCC region 2 west of 130° west or below 20° north
E
A
G
N,T
(200 W)
7.175
N,T outside region 2
7.025
7.125
See Sections 97.305(c), 97.307(f)(11) and 97.301(e).These exemptions do not apply to stations in the continental US.
30 Meters (10.1 MHz)
Avoid interference to fixed services outside the US.
200 Watts PEP
E,A,G
10.100
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20 Meters (14 MHz)
14.000
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18.110
18.168 MHz
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21.200
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21.275
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21.200
12 Meters (24 MHz)
E,A,G
24.890
24.930
24.990 MHz
10 Meters (28 MHz)
28.000
28.300
29.700 MHz
E,A,G
N,T
(200 W)
28.000
28.500
6 Meters (50 MHz)
50.1
E,A,G,T
50.0
54.0 MHz
2 Meters (144 MHz)
144.1
E,A,G,T
144.0
148.0 MHz
1.25 Meters (222 MHz)
E,A,G,T
N (25 W)
219.0
220.0
222.0
225.0 MHz
*Geographical and power restrictions may apply to all bands above 420 MHz. See The ARRL Operating Manual for information about your area.
70 cm (420 MHz)*
E,A,G,T
420.0
450.0 MHz
33 cm (902 MHz)*
E,A,G,T
902.0
928.0 MHz
23 cm (1240 MHz)*
1240
1300 MHz
E,A,G,T
N (5 W)
1270
1295
All licensees except Novices are authorized all modes on the following frequencies:
2300-2310 MHz
2390-2450 MHz
3300-3500 MHz
5650-5925 MHz
10.0-10.5 GHz ‡
24.0-24.25 GHz
47.0-47.2 GHz
76.0-81.0 GHz
122.25-123.0 GHz
134-141 GHz
241-250 GHz
All above 275 GHz
‡ No pulse emissions
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= phone and image
= CW only
= SSB phone
= USB phone, CW, RTTY, and data
= Fixed digital message forwarding systems only
E = Amateur Extra
A = Advanced
G = General
T = Technician
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See ARRLWeb at www.arrl.org for detailed band plans.
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Exams: 860-594-0300 email: vec@arrl.org
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G1B01 [97.15(a)]

What is the maximum height above ground for an antenna structure not near a public use airport without requiring notification to the FAA and registration with the FCC?

A. 50 feet
B. 100 feet
C. 200 feet
D. 250 feet

G1B01 (C) [97.15(a)]

What is the maximum height above ground for an antenna structure not near a public use airport without requiring notification to the FAA and registration with the FCC?

A. 50 feet

B. 100 feet

C. 200 feet

D. 250 feet

G1B02 [97.203(b)]

With which of the following conditions must beacon stations comply?

A. No more than one beacon station may transmit in the same band from the same station location

B. The frequency must be coordinated with the National Beacon Organization

C. The frequency must be posted on the internet or published in a national periodical

D. All these choices are correct

G1B02 (A) [97.203(b)]

With which of the following conditions must beacon stations comply?

A. No more than one beacon station may transmit in the same band from the same station location

B. The frequency must be coordinated with the National Beacon Organization

C. The frequency must be posted on the internet or published in a national periodical

D. All these choices are correct

G1B03 [97.3(a)(9)]

Which of the following is a purpose of a beacon station as identified in the FCC rules?

A. Observation of propagation and reception

B. Automatic identification of repeaters

C. Transmission of bulletins of general interest to amateur radio licensees

D. All these choices are correct

G1B03 (A) [97.3(a)(9)]

Which of the following is a purpose of a beacon station as identified in the FCC rules?

A. Observation of propagation and reception

B. Automatic identification of repeaters

C. Transmission of bulletins of general interest to amateur radio licensees

D. All these choices are correct

G1B04 [97.113(c)]

Which of the following transmissions is permitted for all amateur stations?

A. Unidentified transmissions of less than 10 seconds duration for test purposes only

B. Automatic retransmission of other amateur signals by any amateur station

C. Occasional retransmission of weather and propagation forecast information from US government stations

D. Encrypted messages, if not intended to facilitate a criminal act

G1B04 (C) [97.113(c)]

Which of the following transmissions is permitted for all amateur stations?

A. Unidentified transmissions of less than 10 seconds duration for test purposes only

B. Automatic retransmission of other amateur signals by any amateur station

C. Occasional retransmission of weather and propagation forecast information from US government stations

D. Encrypted messages, if not intended to facilitate a criminal act

G1B05 [97.111((5)(b)]

Which of the following one-way transmissions are permitted?

A. Unidentified test transmissions of less than 10 seconds in duration

B. Transmissions to assist with learning the International Morse code

C. Regular transmissions offering equipment for sale, if intended for amateur radio use

D. All these choices are correct

G1B05 (B) [97.111((5)(b)]

Which of the following one-way transmissions are permitted?

A. Unidentified test transmissions of less than 10 seconds in duration

B. Transmissions to assist with learning the International Morse code

C. Regular transmissions offering equipment for sale, if intended for amateur radio use

D. All these choices are correct

G1B06 [97.15(b), PRB-1, 101 FCC 2d 952 (1985)]

Under what conditions are state and local governments permitted to regulate amateur radio antenna structures?

A. Under no circumstances, FCC rules take priority

B. At any time and to any extent necessary to accomplish a legitimate purpose of the state or local entity, provided that proper filings are made with the FCC

C. Only when such structures exceed 50 feet in height and are clearly visible 1,000 feet from the structure

D. Amateur Service communications must be reasonably accommodated, and regulations must constitute the minimum practical to accommodate a legitimate purpose of the state or local entity

G1B06 (D) [97.15(b), PRB-1, 101 FCC 2d 952 (1985)]

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A. Under no circumstances, FCC rules take priority

B. At any time and to any extent necessary to accomplish a legitimate purpose of the state or local entity, provided that proper filings are made with the FCC

C. Only when such structures exceed 50 feet in height and are clearly visible 1,000 feet from the structure

D. Amateur Service communications must be reasonably accommodated, and regulations must constitute the minimum practical to accommodate a legitimate purpose of the state or local entity

G1B07 [97.113(a)(4)]

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

A. Only “Q” signals are permitted

B. They may be used if they do not obscure the meaning of a message

C. They are not permitted

D. They are limited to those expressly listed in Part 97 of the FCC rules

G1B07 (B) [97.113(a)(4)]

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

A. Only “Q” signals are permitted

B. They may be used if they do not obscure the meaning of a message

C. They are not permitted

D. They are limited to those expressly listed in Part 97 of the FCC rules

G1B08 [97.111(a)(1)]

When is it permissible to communicate with amateur stations in countries outside the areas administered by the Federal Communications Commission?

A. Only when the foreign country has a formal third-party agreement filed with the FCC

B. When the contact is with amateurs in any country except those whose administrations have notified the ITU that they object to such communications

C. Only when the contact is with amateurs licensed by a country which is a member of the United Nations, or by a territory possessed by such a country

D. Only when the contact is with amateurs licensed by a country which is a member of the International Amateur Radio Union, or by a territory possessed by such a country

G1B08 (B) [97.111(a)(1)]

When is it permissible to communicate with amateur stations in countries outside the areas administered by the Federal Communications Commission?

A. Only when the foreign country has a formal third-party agreement filed with the FCC

B. When the contact is with amateurs in any country except those whose administrations have notified the ITU that they object to such communications

C. Only when the contact is with amateurs licensed by a country which is a member of the United Nations, or by a territory possessed by such a country

D. Only when the contact is with amateurs licensed by a country which is a member of the International Amateur Radio Union, or by a territory possessed by such a country

G1B09 [97.203(d)]

On what HF frequencies are automatically controlled beacons permitted?

A. On any frequency if power is less than 1 watt

B. On any frequency if transmissions are in Morse code

C. 21.08 MHz to 21.09 MHz

D. 28.20 MHz to 28.30 MHz

G1B09 (D) [97.203(d)]

On what HF frequencies are automatically controlled beacons permitted?

A. On any frequency if power is less than 1 watt

B. On any frequency if transmissions are in Morse code

C. 21.08 MHz to 21.09 MHz

D. 28.20 MHz to 28.30 MHz

G1B10 [97.203(c)]

What is the power limit for beacon stations?

A. 10 watts PEP output

B. 20 watts PEP output

C. 100 watts PEP output

D. 200 watts PEP output

G1B10 (C) [97.203(c)]

What is the power limit for beacon stations?

A. 10 watts PEP output

B. 20 watts PEP output

C. 100 watts PEP output

D. 200 watts PEP output

G1B11 [97.101(a)]

Who or what determines “good engineering and good amateur practice,” as applied to the operation of an amateur station in all respects not covered by the Part 97 rules?

A. The FCC

B. The control operator

C. The IEEE

D. The ITU

G1B11 (A) [97.101(a)]

Who or what determines "good engineering and good amateur practice," as applied to the operation of an amateur station in all respects not covered by the Part 97 rules?

A. The FCC

B. The control operator

C. The IEEE

D. The ITU

G1C – Transmitter power regulations; data emission standards; 60-meter operation requirements

G1C01 [97.313(c)(1)]

What is the maximum transmitter power an amateur station may use on 10.140 MHz?

A. 200 watts PEP output
B. 1000 watts PEP output
C. 1500 watts PEP output
D. 2000 watts PEP output

G1C01 (A) [97.313(c)(1)]

What is the maximum transmitter power an amateur station may use on 10.140 MHz?

A. 200 watts PEP output

B. 1000 watts PEP output

C. 1500 watts PEP output

D. 2000 watts PEP output

G1C02 [97.313]

What is the maximum transmitter power an amateur station may use on the 12-meter band?

A. 50 watts PEP output

B. 200 watts PEP output

C. 1500 watts PEP output

D. An effective radiated power equivalent to 100 watts from a half-wave dipole

G1C02 (C) [97.313]

What is the maximum transmitter power an amateur station may use on the 12-meter band?

A. 50 watts PEP output

B. 200 watts PEP output

C. 1500 watts PEP output

D. An effective radiated power equivalent to 100 watts from a half-wave dipole

G1C03 [97.303(h)(1)]
What is the maximum bandwidth permitted by FCC rules for amateur radio stations transmitting on USB frequencies in the 60-meter band?

A. 2.8 kHz
B. 5.6 kHz
C. 1.8 kHz
D. 3 kHz

G1C03 (A) [97.303(h)(1)]

What is the maximum bandwidth permitted by FCC rules for amateur radio stations transmitting on USB frequencies in the 60-meter band?

A. 2.8 kHz

B. 5.6 kHz

C. 1.8 kHz

D. 3 kHz

G1C04 [97.303(i)]
Which of the following is required by the FCC rules when operating in the 60-meter band?

A. If you are using an antenna other than a dipole, you must keep a record of the gain of your antenna

B. You must keep a record of the date, time, frequency, power level, and stations worked

C. You must keep a record of all third-party traffic

D. You must keep a record of the manufacturer of your equipment and the antenna used

G1C04 (A) [97.303(i)]

Which of the following is required by the FCC rules when operating in the 60-meter band?

A. If you are using an antenna other than a dipole, you must keep a record of the gain of your antenna

B. You must keep a record of the date, time, frequency, power level, and stations worked

C. You must keep a record of all third-party traffic

D. You must keep a record of the manufacturer of your equipment and the antenna used

G1C05 [97.313]

What is the limit for transmitter power on the 28 MHz band for a General Class control operator?

A. 100 watts PEP output

B. 1000 watts PEP output

C. 1500 watts PEP output

D. 2000 watts PEP output

G1C05 (C) [97.313]

What is the limit for transmitter power on the 28 MHz band for a General Class control operator?

A. 100 watts PEP output

B. 1000 watts PEP output

C. 1500 watts PEP output

D. 2000 watts PEP output

G1C07 [97.309(a)(4)]

What must be done before using a new digital protocol on the air?

A. Type-certify equipment to FCC standards

B. Obtain an experimental license from the FCC

C. Publicly document the technical characteristics of the protocol

D. Submit a rule-making proposal to the FCC describing the codes and methods of the technique

G1C07 (C) [97.309(a)(4)]

What must be done before using a new digital protocol on the air?

A. Type-certify equipment to FCC standards

B. Obtain an experimental license from the FCC

C. Publicly document the technical characteristics of the protocol

D. Submit a rule-making proposal to the FCC describing the codes and methods of the technique

G1C09 [97.313(i)]

What is the maximum power limit on the 60-meter band?

A. 1500 watts PEP

B. 10 watts RMS

C. ERP of 100 watts PEP with respect to a dipole

D. ERP of 100 watts PEP with respect to an isotropic antenna

G1C09 (C) [97.313(i)]

What is the maximum power limit on the 60-meter band?

A. 1500 watts PEP

B. 10 watts RMS

C. ERP of 100 watts PEP with respect to a dipole

D. ERP of 100 watts PEP with respect to an isotropic antenna

G1C11 [97.313]

What measurement is specified by FCC rules that regulate maximum power?

A. RMS output from the transmitter
B. RMS input to the antenna
C. PEP input to the antenna
D. PEP output from the transmitter

G1C11 (D) [97.313]

What measurement is specified by FCC rules that regulate maximum power?

A. RMS output from the transmitter

B. RMS input to the antenna

C. PEP input to the antenna

D. PEP output from the transmitter

G1D

Volunteer Examiners and Volunteer Examiner Coordinators; temporary identification; element credit; remote operation

G1D01 [97.501, 97.505(a)]
Who may receive partial credit for the elements represented by an expired amateur radio license?

A. Any person who can demonstrate that they once held an FCC-issued General, Advanced, or Amateur Extra
class license that was not revoked by the FCC

B. Anyone who held an FCC-issued amateur radio license that expired not less than 5 and not more than 15
years ago

C. Any person who previously held an amateur license issued by another country, but only if that country has a
current reciprocal licensing agreement with the FCC

D. Only persons who once held an FCC issued Novice, Technician, or Technician Plus license

G1D01 (A) [97.501, 97.505(a)]
Who may receive partial credit for the elements represented by an expired amateur radio license?

A. Any person who can demonstrate that they once held an FCC-issued General, Advanced, or Amateur Extra class license that was not revoked by the FCC

B. Anyone who held an FCC-issued amateur radio license that expired not less than 5 and not more than 15 years ago

C. Any person who previously held an amateur license issued by another country, but only if that country has a current reciprocal licensing agreement with the FCC

D. Only persons who once held an FCC issued Novice, Technician, or Technician Plus license

G1D02 [97.509(b)(3)(i)]

What license examinations may you administer as an accredited Volunteer Examiner holding a General class operator license?

A. General and Technician

B. None, only Amateur Extra class licensees may be accredited

C. Technician only

D. Amateur Extra, General, and Technician

G1D02 (C) [97.509(b)(3)(i)]

What license examinations may you administer as an accredited Volunteer Examiner holding a General class operator license?

A. General and Technician

B. None, only Amateur Extra class licensees may be accredited

C. Technician only

D. Amateur Extra, General, and Technician

G1D03 [97.9(b)]

On which of the following band segments may you operate if you are a Technician class operator and have an unexpired Certificate of Successful Completion of Examination (CSCE) for General class privileges?

A. Only the Technician band segments until your upgrade is posted in the FCC database

B. Only on the Technician band segments until you have a receipt for the FCC application fee payment

C. On any General or Technician class band segment

D. On any General or Technician class band segment except 30 meters and 60 meters

G1D03 (C) [97.9(b)]

On which of the following band segments may you operate if you are a Technician class operator and have an unexpired Certificate of Successful Completion of Examination (CSCE) for General class privileges?

A. Only the Technician band segments until your upgrade is posted in the FCC database

B. Only on the Technician band segments until you have a receipt for the FCC application fee payment

C. On any General or Technician class band segment

D. On any General or Technician class band segment except 30 meters and 60 meters

G1D04 [97.509(3)(i)(c)]
Who must observe the administration of a Technician class license examination?

A. At least three Volunteer Examiners of General class or higher

B. At least two Volunteer Examiners of General class or higher

C. At least two Volunteer Examiners of Technician class or higher

D. At least three Volunteer Examiners of Technician class

G1D04 (A) [97.509(3)(i)(c)]

Who must observe the administration of a Technician class license examination?

A. At least three Volunteer Examiners of General class or higher

B. At least two Volunteer Examiners of General class or higher

C. At least two Volunteer Examiners of Technician class or higher

D. At least three Volunteer Examiners of Technician class

G1D05 [97.7]
When operating a US station by remote control from outside the country, what license is required of the control operator?

A. A US operator/primary station license

B. Only an appropriate US operator/primary license and a special remote station permit from the FCC

C. Only a license from the foreign country, as long as the call sign includes identification of portable operation in the US

D. A license from the foreign country and a special remote station permit from the FCC

G1D05 (A) [97.7]

When operating a US station by remote control from outside the country, what license is required of the control operator?

A. A US operator/primary station license

B. Only an appropriate US operator/primary license and a special remote station permit from the FCC

C. Only a license from the foreign country, as long as the call sign includes identification of portable operation in the US

D. A license from the foreign country and a special remote station permit from the FCC

G1D06 [97.119(f)(2)]

Until an upgrade to General class is shown in the FCC database, when must a Technician licensee identify with "AG" after their call sign?

A. Whenever they operate using General class frequency privileges
B. Whenever they operate on any amateur frequency
C. Whenever they operate using Technician frequency privileges
D. A special identifier is not required if their General class license application has been filed with the FCC

G1D06 (A) [97.119(f)(2)]

Until an upgrade to General class is shown in the FCC database, when must a Technician licensee identify with “AG” after their call sign?

A. Whenever they operate using General class frequency privileges

B. Whenever they operate on any amateur frequency

C. Whenever they operate using Technician frequency privileges

D. A special identifier is not required if their General class license application has been filed with the FCC

G1D07 [97.509(b)(1)]

Volunteer Examiners are accredited by what organization?

A. The Federal Communications Commission
B. The Universal Licensing System
C. A Volunteer Examiner Coordinator
D. The Wireless Telecommunications Bureau

G1D07 (C) [97.509(b)(1)]

Volunteer Examiners are accredited by what organization?

A. The Federal Communications Commission

B. The Universal Licensing System

C. A Volunteer Examiner Coordinator

D. The Wireless Telecommunications Bureau

G1D08 [97.509(b)(3)]

Which of the following criteria must be met for a non-US citizen to be an accredited Volunteer Examiner?

A. The person must be a resident of the US for a minimum of 5 years

B. The person must hold an FCC granted amateur radio license of General class or above

C. The person’s home citizenship must be in ITU region 2

D. None of these choices is correct; a non-US citizen cannot be a Volunteer Examiner

G1D08 (B) [97.509(b)(3)]

Which of the following criteria must be met for a non-US citizen to be an accredited Volunteer Examiner?

A. The person must be a resident of the US for a minimum of 5 years

B. The person must hold an FCC granted amateur radio license of General class or above

C. The person's home citizenship must be in ITU region 2

D. None of these choices is correct; a non-US citizen cannot be a Volunteer Examiner

G1D09 [97.9(b)]

How long is a Certificate of Successful Completion of Examination (CSCE) valid for exam element credit?

A. 30 days

B. 180 days

C. 365 days

D. For as long as your current license is valid

G1D09 (C) [97.9(b)]

How long is a Certificate of Successful Completion of Examination (CSCE) valid for exam element credit?

A. 30 days

B. 180 days

C. 365 days

D. For as long as your current license is valid

G1D10 [97.509(b)(2)]

What is the minimum age that one must be to qualify as an accredited Volunteer Examiner?

A. 16 years
B. 18 years
C. 21 years
D. There is no age limit

G1D10 (B) [97.509(b)(2)]

What is the minimum age that one must be to qualify as an accredited Volunteer Examiner?

A. 16 years

B. 18 years

C. 21 years

D. There is no age limit

G1D11 [97.505]

What action is required to obtain a new General class license after a previously held license has expired and the two-year grace period has passed?

A. They must have a letter from the FCC showing they once held an amateur or commercial license

B. There are no requirements other than being able to show a copy of the expired license

C. Contact the FCC to have the license reinstated

D. The applicant must show proof of the appropriate expired license grant and pass the current Element 2 exam

G1D11 (D) [97.505]

What action is required to obtain a new General class license after a previously held license has expired and the two-year grace period has passed?

A. They must have a letter from the FCC showing they once held an amateur or commercial license

B. There are no requirements other than being able to show a copy of the expired license

C. Contact the FCC to have the license reinstated

D. The applicant must show proof of the appropriate expired license grant and pass the current Element 2 exam

G1D12 [97.507]
When operating a station in South America by remote control over the internet from the US, what regulations apply?

A. Those of both the remote station’s country and the FCC

B. Those of the remote station’s country and the FCC’s third-party regulations

C. Only those of the remote station’s country

D. Only those of the FCC

G1D12 (C) [97.507]

When operating a station in South America by remote control over the internet from the US, what regulations apply?

A. Those of both the remote station’s country and the FCC

B. Those of the remote station’s country and the FCC’s third-party regulations

C. Only those of the remote station’s country

D. Only those of the FCC

SUBELEMENT G2 – OPERATING PROCEDURES

[5 Exam Questions – 5 Groups]

G2A – Phone operating procedures: USB/LSB conventions, breaking into a contact, transmitter setup for voice operation; answering DX stations

G2A01

Which mode is most commonly used for voice communications on frequencies of 14 MHz or higher?

A. Upper sideband
B. Lower sideband
C. Suppressed sideband
D. Double sideband

G2A01 (A)

Which mode is most commonly used for voice communications on frequencies of 14 MHz or higher?

A. Upper sideband
B. Lower sideband
C. Suppressed sideband
D. Double sideband

G2A02
Which mode is most commonly used for voice communications on the 160-, 75-, and 40-meter bands?

A. Upper sideband
B. Lower sideband
C. Suppressed sideband
D. Double sideband

G2A02 (B)
Which mode is most commonly used for voice communications on the 160-, 75-, and 40-meter bands?

A. Upper sideband
B. Lower sideband
C. Suppressed sideband
D. Double sideband

G2A03
Which mode is most commonly used for SSB voice communications in the VHF and UHF bands?

A. Upper sideband
B. Lower sideband
C. Suppressed sideband
D. Double sideband

G2A03 (A)
Which mode is most commonly used for SSB voice communications in the VHF and UHF bands?

A. Upper sideband
B. Lower sideband
C. Suppressed sideband
D. Double sideband

G2A04
Which mode is most commonly used for voice communications on the 17- and 12-meter bands?

A. Upper sideband
B. Lower sideband
C. Suppressed sideband
D. Double sideband

G2A04 (A)
Which mode is most commonly used for voice communications on the 17- and 12-meter bands?

A. Upper sideband
B. Lower sideband
C. Suppressed sideband
D. Double sideband

G2A05

Which mode of voice communication is most commonly used on the HF amateur bands?

A. Frequency modulation
B. Double sideband
C. Single sideband
D. Single phase modulation

G2A05 (C)
Which mode of voice communication is most commonly used on the HF amateur bands?

A. Frequency modulation
B. Double sideband
C. Single sideband
D. Single phase modulation

G2A06

Which of the following is an advantage of using single sideband, as compared to other analog voice modes on the HF amateur bands?

A. Very high-fidelity voice modulation

B. Less subject to interference from atmospheric static crashes

C. Ease of tuning on receive and immunity to impulse noise

D. Less bandwidth used and greater power efficiency

G2A06 (D)
Which of the following is an advantage of using single sideband, as compared to other analog voice modes on the HF amateur bands?

A. Very high-fidelity voice modulation

B. Less subject to interference from atmospheric static crashes

C. Ease of tuning on receive and immunity to impulse noise

D. Less bandwidth used and greater power efficiency

G2A07
Which of the following statements is true of single sideband (SSB)?

A. Only one sideband and the carrier are transmitted; the other sideband is suppressed

B. Only one sideband is transmitted; the other sideband and carrier are suppressed

C. SSB is the only voice mode authorized on the 20-, 15-, and 10-meter amateur bands

D. SSB is the only voice mode authorized on the 160-, 75-, and 40-meter amateur bands

G2A07 (B)
Which of the following statements is true of single sideband (SSB)?

A. Only one sideband and the carrier are transmitted; the other sideband is suppressed

B. Only one sideband is transmitted; the other sideband and carrier are suppressed

C. SSB is the only voice mode authorized on the 20-, 15-, and 10-meter amateur bands

D. SSB is the only voice mode authorized on the 160-, 75-, and 40-meter amateur bands

G2A08

What is the recommended way to break into a phone contact?

A. Say “QRZ” several times, followed by your call sign

B. Say your call sign once

C. Say “Breaker Breaker”

D. Say “CQ” followed by the call sign of either station

G2A08 (B)
What is the recommended way to break into a phone contact?

A. Say “QRZ” several times, followed by your call sign
B. Say your call sign once
C. Say “Breaker Breaker”
D. Say “CQ” followed by the call sign of either station

G2A09
Why do most amateur stations use lower sideband on the 160-, 75-, and 40-meter bands?

A. Lower sideband is more efficient than upper sideband at these frequencies

B. Lower sideband is the only sideband legal on these frequency bands

C. Because it is fully compatible with an AM detector

D. It is commonly accepted amateur practice

G2A09 (D)
Why do most amateur stations use lower sideband on the 160-, 75-, and 40-meter bands?

A. Lower sideband is more efficient than upper sideband at these frequencies

B. Lower sideband is the only sideband legal on these frequency bands

C. Because it is fully compatible with an AM detector

D. It is commonly accepted amateur practice

G2A10
Which of the following statements is true of VOX operation versus PTT operation?

A. The received signal is more natural sounding

B. It allows “hands free” operation

C. It occupies less bandwidth

D. It provides more power output

G2A10 (B)
Which of the following statements is true of VOX operation versus PTT operation?

A. The received signal is more natural sounding

B. It allows “hands free” operation

C. It occupies less bandwidth

D. It provides more power output

G2A11
Generally, who should respond to a station in the contiguous 48 states calling "CQ DX"?

A. Any caller is welcome to respond

B. Only stations in Germany

C. Any stations outside the lower 48 states

D. Only contest stations

G2A11 (C)
Generally, who should respond to a station in the contiguous 48 states calling “CQ DX”?

A. Any caller is welcome to respond

B. Only stations in Germany

C. Any stations outside the lower 48 states

D. Only contest stations

G2A12
What control is typically adjusted for proper ALC setting on a single sideband transceiver?

A. RF clipping level

B. Transmit audio or microphone gain

C. Antenna inductance or capacitance

D. Attenuator level

G2A12 (B)
What control is typically adjusted for proper ALC setting on a single sideband transceiver?

A. RF clipping level

B. Transmit audio or microphone gain

C. Antenna inductance or capacitance

D. Attenuator level

G2B – Operating effectively; band plans; drills and emergencies; RACES operation

G2B01 [97.101(b), (c)]
Which of the following is true concerning access to frequencies?

A. Nets have priority

B. QSOs in progress have priority

C. Except during emergencies, no amateur station has priority access to any frequency

D. Contest operations should yield to non-contest use of frequencies

G2B01 (C) [97.101(b), (c)]
Which of the following is true concerning access to frequencies?

A. Nets have priority

B. QSOs in progress have priority

<u>C. Except during emergencies, no amateur station has priority access to any frequency</u>

D. Contest operations should yield to non-contest use of frequencies

G2B02
What is the first thing you should do if you are communicating with another amateur station and hear a station in distress break in?

A. Inform your local emergency coordinator

B. Acknowledge the station in distress and determine what assistance may be needed

C. Immediately decrease power to avoid interfering with the station in distress

D. Immediately cease all transmissions

G2B02 (B)

What is the first thing you should do if you are communicating with another amateur station and hear a station in distress break in?

A. Inform your local emergency coordinator

B. Acknowledge the station in distress and determine what assistance may be needed

C. Immediately decrease power to avoid interfering with the station in distress

D. Immediately cease all transmissions

G2B03
What is good amateur practice if propagation changes during a contact creating interference from other stations using the frequency?

A. Advise the interfering stations that you are on the frequency and that you have priority

B. Decrease power and continue to transmit

C. Attempt to resolve the interference problem with the other stations in a mutually acceptable manner

D. Switch to the opposite sideband

G2B03 (C)
What is good amateur practice if propagation changes during a contact creating interference from other stations using the frequency?

A. Advise the interfering stations that you are on the frequency and that you have priority

B. Decrease power and continue to transmit

C. Attempt to resolve the interference problem with the other stations in a mutually acceptable manner

D. Switch to the opposite sideband

G2B04
When selecting a CW transmitting frequency, what minimum separation from other stations should be used to minimize interference to stations on adjacent frequencies?

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

G2B04 (B)
When selecting a CW transmitting frequency, what minimum separation from other stations should be used to minimize interference to stations on adjacent frequencies?

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

G2B05
When selecting an SSB transmitting frequency, what minimum separation should be used to minimize interference to stations on adjacent frequencies?

A. 5 Hz to 50 Hz
B. 150 Hz to 500 Hz
C. 2 kHz to 3 kHz
D. Approximately 6 kHz

G2B05 (C)
When selecting an SSB transmitting frequency, what minimum separation should be used to minimize interference to stations on adjacent frequencies?

A. 5 Hz to 50 Hz
B. 150 Hz to 500 Hz
C. 2 kHz to 3 kHz
D. Approximately 6 kHz

G2B06

How can you avoid harmful interference on an apparently clear frequency before calling CQ on CW or phone?

A. Send “QRL?” on CW, followed by your call sign; or, if using phone, ask if the frequency is in use, followed by your call sign

B. Listen for 2 minutes before calling CQ

C. Send the letter “V” in Morse code several times and listen for a response, or say “test” several times and listen for a response

D. Send “QSY” on CW or if using phone, announce “the frequency is in use,” then give your call sign and listen for a response

G2B06 (A)
How can you avoid harmful interference on an apparently clear frequency before calling CQ on CW or phone?

A. Send "QRL?" on CW, followed by your call sign; or, if using phone, ask if the frequency is in use, followed by your call sign

B. Listen for 2 minutes before calling CQ

C. Send the letter "V" in Morse code several times and listen for a response, or say "test" several times and listen for a response

D. Send "QSY" on CW or if using phone, announce "the frequency is in use," then give your call sign and listen for a response

G2B07
Which of the following complies with commonly accepted amateur practice when choosing a frequency on which to initiate a call?

A. Listen on the frequency for at least two minutes to be sure it is clear

B. Identify your station by transmitting your call sign at least 3 times

C. Follow the voluntary band plan

D. All these choices are correct

G2B07 (C)
Which of the following complies with commonly accepted amateur practice when choosing a frequency on which to initiate a call?

A. Listen on the frequency for at least two minutes to be sure it is clear

B. Identify your station by transmitting your call sign at least 3 times

C. Follow the voluntary band plan

D. All these choices are correct

G2B08
What is the voluntary band plan restriction for US stations transmitting within the 48 contiguous states in the 50.1 MHz to 50.125 MHz band segment?

A. Only contacts with stations not within the 48 contiguous states

B. Only contacts with other stations within the 48 contiguous states

C. Only digital contacts

D. Only SSTV contacts

G2B08 (A)
What is the voluntary band plan restriction for US stations transmitting within the 48 contiguous states in the 50.1 MHz to 50.125 MHz band segment?

A. Only contacts with stations not within the 48 contiguous states

B. Only contacts with other stations within the 48 contiguous states

C. Only digital contacts

D. Only SSTV contacts

G2B09 [97.407(a)]
Who may be the control operator of an amateur station transmitting in RACES to assist relief operations during a disaster?

A. Only a person holding an FCC-issued amateur operator license

B. Only a RACES net control operator

C. A person holding an FCC-issued amateur operator license or an appropriate government official

D. Any control operator when normal communication systems are operational

G2B09 (A) [97.407(a)]
Who may be the control operator of an amateur station transmitting in RACES to assist relief operations during a disaster?

A. Only a person holding an FCC-issued amateur operator license

B. Only a RACES net control operator

C. A person holding an FCC-issued amateur operator license or an appropriate government official

D. Any control operator when normal communication systems are operational

G2B10
Which of the following is good amateur practice for net management?

A. Always use multiple sets of phonetics during check-in

B. Have a backup frequency in case of interference or poor conditions

C. Transmit the full net roster at the beginning of every session

D. All these choices are correct

G2B10 (B)
Which of the following is good amateur practice for net management?

A. Always use multiple sets of phonetics during check-in

B. Have a backup frequency in case of interference or poor conditions

C. Transmit the full net roster at the beginning of every session

D. All these choices are correct

G2B11 [97.407(d)(4)]
How often may RACES training drills and tests be routinely conducted without special authorization?

A. No more than 1 hour per month
B. No more than 2 hours per month
C. No more than 1 hour per week
D. No more than 2 hours per week

G2B11 (C) [97.407(d)(4)]
How often may RACES training drills and tests be routinely conducted without special authorization?

A. No more than 1 hour per month
B. No more than 2 hours per month
C. No more than 1 hour per week
D. No more than 2 hours per week

G2C – CW operating procedures and procedural signals; Q signals; full break-in

G2C01
Which of the following describes full break-in CW operation (QSK)?

A. Breaking stations send the Morse code prosign “BK”

B. Automatic keyers, instead of hand keys, are used to send Morse code

C. An operator must activate a manual send/receive switch before and after every transmission

D. Transmitting stations can receive between code characters and elements

G2C01 (D)
Which of the following describes full break-in CW operation (QSK)?

A. Breaking stations send the Morse code prosign “BK”

B. Automatic keyers, instead of hand keys, are used to send Morse code

C. An operator must activate a manual send/receive switch before and after every transmission

D. Transmitting stations can receive between code characters and elements

G2C02
What should you do if a CW station sends “QRS?”

A. Send slower
B. Change frequency
C. Increase your power
D. Repeat everything twice

G2C02 (A)
What should you do if a CW station sends “QRS?”

<u>A. Send slower</u>
B. Change frequency
C. Increase your power
D. Repeat everything twice

G2C03
What does it mean when a CW operator sends “KN” at the end of a transmission?

A. No US stations should call

B. Operating full break-in

C. Listening only for a specific station or stations

D. Closing station now

G2C03 (C)
What does it mean when a CW operator sends “KN” at the end of a transmission?

A. No US stations should call

B. Operating full break-in

C. Listening only for a specific station or stations

D. Closing station now

G2C04

What does the Q signal “QRL?” mean?

A. “Will you keep the frequency clear?”

B. “Are you operating full break-in?” or “Can you operate full break-in?”

C. “Are you listening only for a specific station?”

D. “Are you busy?” or “Is this frequency in use?”

G2C04 (D)

What does the Q signal “QRL?” mean?

A. “Will you keep the frequency clear?”

B. “Are you operating full break-in?” or “Can you operate full break-in?”

C. “Are you listening only for a specific station?”

D. “Are you busy?” or “Is this frequency in use?”

G2C05
What is the best speed to use when answering a CQ in Morse code?

A. The fastest speed at which you are comfortable copying, but no slower than the CQ

B. The fastest speed at which you are comfortable copying, but no faster than the CQ

C. At the standard calling speed of 10 wpm

D. At the standard calling speed of 5 wpm

G2C05 (B)
What is the best speed to use when answering a CQ in Morse code?

A. The fastest speed at which you are comfortable copying, but no slower than the CQ

B. The fastest speed at which you are comfortable copying, but no faster than the CQ

C. At the standard calling speed of 10 wpm

D. At the standard calling speed of 5 wpm

G2C06
What does the term “zero beat” mean in CW operation?

A. Matching the speed of the transmitting station

B. Operating split to avoid interference on frequency

C. Sending without error

D. Matching the transmit frequency to the frequency of a received signal

G2C06 (D)
What does the term "zero beat" mean in CW operation?

A. Matching the speed of the transmitting station

B. Operating split to avoid interference on frequency

C. Sending without error

D. Matching the transmit frequency to the frequency of a received signal

G2C07
When sending CW, what does a “C” mean when added to the RST report?

A. Chirpy or unstable signal

B. Report was read from an S meter rather than estimated

C. 100 percent copy

D. Key clicks

G2C07 (A)
When sending CW, what does a “C” mean when added to the RST report?

A. Chirpy or unstable signal

B. Report was read from an S meter rather than estimated

C. 100 percent copy

D. Key clicks

G2C08
What prosign is sent to indicate the end of a formal message when using CW?

A. SK

B. BK

C. AR

D. KN

G2C08 (C)
What prosign is sent to indicate the end of a formal message when using CW?

A. SK

B. BK

C. AR

D. KN

G2C09
What does the Q signal “QSL” mean?

A. Send slower

B. We have already confirmed the contact

C. I have received and understood

D. We have worked before

G2C09 (C)
What does the Q signal “QSL” mean?

A. Send slower

B. We have already confirmed the contact

<u>C. I have received and understood</u>

D. We have worked before

G2C10
What does the Q signal "QRN" mean?

A. Send more slowly
B. Stop sending
C. Zero beat my signal
D. I am troubled by static

G2C10 (D)
What does the Q signal “QRN” mean?

A. Send more slowly
B. Stop sending
C. Zero beat my signal
D. I am troubled by static

G2C11
What does the Q signal “QRV” mean?

A. You are sending too fast

B. There is interference on the frequency

C. I am quitting for the day

D. I am ready to receive

G2C11 (D)
What does the Q signal “QRV” mean?

A. You are sending too fast

B. There is interference on the frequency

C. I am quitting for the day

D. I am ready to receive

G2D – Volunteer Monitor Program; HF operations

G2D01
What is the Volunteer Monitor Program?

A. Amateur volunteers who are formally enlisted to monitor the airwaves for rules violations

B. Amateur volunteers who conduct amateur licensing examinations

C. Amateur volunteers who conduct frequency coordination for amateur VHF repeaters

D. Amateur volunteers who use their station equipment to help civil defense organizations in times of emergency

G2D01 (A)
What is the Volunteer Monitor Program?

A. Amateur volunteers who are formally enlisted to monitor the airwaves for rules violations

B. Amateur volunteers who conduct amateur licensing examinations

C. Amateur volunteers who conduct frequency coordination for amateur VHF repeaters

D. Amateur volunteers who use their station equipment to help civil defense organizations in times of emergency

G2D02

Which of the following are objectives of the Volunteer Monitor Program?

A. To conduct efficient and orderly amateur licensing examinations

B. To provide emergency and public safety communications

C. To coordinate repeaters for efficient and orderly spectrum usage

D. To encourage amateur radio operators to self-regulate and comply with the rules

G2D02 (D)

Which of the following are objectives of the Volunteer Monitor Program?

A. To conduct efficient and orderly amateur licensing examinations

B. To provide emergency and public safety communications

C. To coordinate repeaters for efficient and orderly spectrum usage

D. To encourage amateur radio operators to self-regulate and comply with the rules

G2D03

What procedure may be used by Volunteer Monitors to localize a station whose continuous carrier is holding a repeater on in their area?

A. Compare vertical and horizontal signal strengths on the input frequency

B. Compare beam headings on the repeater input from their home locations with that of other Volunteer Monitors

C. Compare signal strengths between the input and output of the repeater

D. All these choices are correct

G2D03 (B)

What procedure may be used by Volunteer Monitors to localize a station whose continuous carrier is holding a repeater on in their area?

A. Compare vertical and horizontal signal strengths on the input frequency

B. Compare beam headings on the repeater input from their home locations with that of other Volunteer Monitors

C. Compare signal strengths between the input and output of the repeater

D. All these choices are correct

G2D04

Which of the following describes an azimuthal projection map?

A. A map that shows accurate land masses

B. A map that shows true bearings and distances from a specific location

C. A map that shows the angle at which an amateur satellite crosses the equator

D. A map that shows the number of degrees longitude that an amateur satellite appears to move westward at the equator with each orbit

G2D04 (B)

Which of the following describes an azimuthal projection map?

A. A map that shows accurate land masses

B. A map that shows true bearings and distances from a specific location

C. A map that shows the angle at which an amateur satellite crosses the equator

D. A map that shows the number of degrees longitude that an amateur satellite appears to move westward at the equator with each orbit

G2D05
Which of the following indicates that you are looking for an HF contact with any station?

A. Sign your call sign once, followed by the words “listening for a call” -- if no answer, change frequency and repeat

B. Say “QTC” followed by “this is” and your call sign -- if no answer, change frequency and repeat

C. Repeat “CQ” a few times, followed by “this is,” then your call sign a few times, then pause to listen, repeat as necessary

D. Transmit an unmodulated carried for approximately 10 seconds, followed by “this is” and your call sign, and pause to listen -- repeat as necessary

G2D05 (C)
Which of the following indicates that you are looking for an HF contact with any station?

A. Sign your call sign once, followed by the words “listening for a call” -- if no answer, change frequency and repeat

B. Say “QTC” followed by “this is” and your call sign -- if no answer, change frequency and repeat

C. Repeat “CQ” a few times, followed by “this is,” then your call sign a few times, then pause to listen, repeat as necessary

D. Transmit an unmodulated carried for approximately 10 seconds, followed by “this is” and your call sign, and pause to listen -- repeat as necessary

G2D06

How is a directional antenna pointed when making a “long-path” contact with another station?

A. Toward the rising sun

B. Along the gray line

C. 180 degrees from the station’s short-path heading

D. Toward the north

G2D06 (C)

How is a directional antenna pointed when making a “long-path” contact with another station?

A. Toward the rising sun

B. Along the gray line

<u>C. 180 degrees from the station’s short-path heading</u>

D. Toward the north

G2D07

Which of the following are examples of the NATO Phonetic Alphabet?

A. Able, Baker, Charlie, Dog

B. Adam, Boy, Charles, David

C. America, Boston, Canada, Denmark

D. Alpha, Bravo, Charlie, Delta

G2D07 (D)

Which of the following are examples of the NATO Phonetic Alphabet?

A. Able, Baker, Charlie, Dog

B. Adam, Boy, Charles, David

C. America, Boston, Canada, Denmark

D. Alpha, Bravo, Charlie, Delta

G2D08

Why do many amateurs keep a station log?

A. The FCC requires a log of all international contacts

B. The FCC requires a log of all international third-party traffic

C. The log provides evidence of operation needed to renew a license without retest

D. To help with a reply if the FCC requests information about your station

G2D08 (D)

Why do many amateurs keep a station log?

A. The FCC requires a log of all international contacts

B. The FCC requires a log of all international third-party traffic

C. The log provides evidence of operation needed to renew a license without retest

D. To help with a reply if the FCC requests information about your station

G2D09

Which of the following is required when participating in a contest on HF frequencies?

A. Submit a log to the contest sponsor

B. Send a QSL card to the stations worked, or QSL via Logbook of The World

C. Identify your station according to normal FCC regulations

D. All these choices are correct

G2D09 (C)

Which of the following is required when participating in a contest on HF frequencies?

A. Submit a log to the contest sponsor

B. Send a QSL card to the stations worked, or QSL via Logbook of The World

C. Identify your station according to normal FCC regulations

D. All these choices are correct

G2D10

What is QRP operation?

A. Remote piloted model control

B. Low-power transmit operation

C. Transmission using Quick Response Protocol

D. Traffic relay procedure net operation

G2D10 (B)

What is QRP operation?

A. Remote piloted model control

B. Low-power transmit operation

C. Transmission using Quick Response Protocol

D. Traffic relay procedure net operation

G2D11

Why are signal reports typically exchanged at the beginning of an HF contact?

A. To allow each station to operate according to conditions

B. To be sure the contact will count for award programs

C. To follow standard radiogram structure

D. To allow each station to calibrate their frequency display

G2D11 (A)

Why are signal reports typically exchanged at the beginning of an HF contact?

A. To allow each station to operate according to conditions

B. To be sure the contact will count for award programs

C. To follow standard radiogram structure

D. To allow each station to calibrate their frequency display

G2E – Digital mode operating procedures

G2E01

Which mode is normally used when sending RTTY signals via AFSK with an SSB transmitter?

A. USB

B. DSB

C. CW

D. LSB

G2E01 (D)

Which mode is normally used when sending RTTY signals via AFSK with an SSB transmitter?

A. USB

B. DSB

C. CW

D. LSB

G2E02

What is VARA?

A. A low signal-to-noise digital mode used for EME (moonbounce)

B. A digital protocol used with Winlink

C. A radio direction finding system used on VHF and UHF

D.A DX spotting system using a network of software defined radios

G2E02 (B)
What is VARA?

A. A low signal-to-noise digital mode used for EME (moonbounce)

B. A digital protocol used with Winlink

C. A radio direction finding system used on VHF and UHF

D.A DX spotting system using a network of software defined radios

G2E03

What symptoms may result from other signals interfering with a PACTOR or VARA transmission?

A. Frequent retries or timeouts

B. Long pauses in message transmission

C. Failure to establish a connection between stations

D. All these choices are correct

G2E03 (D)

What symptoms may result from other signals interfering with a PACTOR or VARA transmission?

A. Frequent retries or timeouts

B. Long pauses in message transmission

C. Failure to establish a connection between stations

D. All these choices are correct

G2E04

Which of the following is good practice when choosing a transmitting frequency to answer a station calling CQ using FT8?

A. Always call on the station’s frequency

B. Call on any frequency in the waterfall except the station’s frequency

C. Find a clear frequency during the same time slot as the calling station

D. Find a clear frequency during the alternate time slot to the calling station

G2E04 (D)

Which of the following is good practice when choosing a transmitting frequency to answer a station calling CQ using FT8?

A. Always call on the station's frequency

B. Call on any frequency in the waterfall except the station's frequency

C. Find a clear frequency during the same time slot as the calling station

D. Find a clear frequency during the alternate time slot to the calling station

G2E05

What is the standard sideband for JT65, JT9, FT4, or FT8 digital signal when using AFSK?

A. LSB

B. USB

C. DSB

D. SSB

G2E05 (B)

What is the standard sideband for JT65, JT9, FT4, or FT8 digital signal when using AFSK?

A. LSB

B. USB

C. DSB

D. SSB

G2E06

What is the most common frequency shift for RTTY emissions in the amateur HF bands?

A. 85 Hz

B. 170 Hz

C. 425 Hz

D. 850 Hz

G2E06 (B)

What is the most common frequency shift for RTTY emissions in the amateur HF bands?

A. 85 Hz

B. 170 Hz

C. 425 Hz

D. 850 Hz

G2E07

Which of the following is required when using FT8?

A. A special hardware modem

B. Computer time accurate to within approximately 1 second

C. Receiver attenuator set to -12 dB

D. A vertically polarized antenna

G2E07 (B)

Which of the following is required when using FT8?

A. A special hardware modem

B. Computer time accurate to within approximately 1 second

C. Receiver attenuator set to -12 dB

D. A vertically polarized antenna

G2E08

In what segment of the 20-meter band are most digital mode operations commonly found?

A. At the bottom of the slow-scan TV segment, near 14.230 MHz

B. At the top of the SSB phone segment, near 14.325 MHz

C. In the middle of the CW segment, near 14.100 MHz

D. Between 14.070 MHz and 14.100 MHz

G2E08 (D)

In what segment of the 20-meter band are most digital mode operations commonly found?

A. At the bottom of the slow-scan TV segment, near 14.230 MHz

B. At the top of the SSB phone segment, near 14.325 MHz

C. In the middle of the CW segment, near 14.100 MHz

D. Between 14.070 MHz and 14.100 MHz

G2E09

How do you join a contact between two stations using the PACTOR protocol?

A. Send broadcast packets containing your call sign while in MONITOR mode

B. Transmit a steady carrier until the PACTOR protocol times out and disconnects

C. Joining an existing contact is not possible, PACTOR connections are limited to two stations

D. Send a NAK code

G2E09 (C)

How do you join a contact between two stations using the PACTOR protocol?

A. Send broadcast packets containing your call sign while in MONITOR mode

B. Transmit a steady carrier until the PACTOR protocol times out and disconnects

C. Joining an existing contact is not possible, PACTOR connections are limited to two stations

D. Send a NAK code

G2E10

Which of the following is a way to establish contact with a digital messaging system gateway station?

A. Send an email to the system control operator

B. Send QRL in Morse code

C. Respond when the station broadcasts its SSID

D. Transmit a connect message on the station's published frequency

G2E10 (D)

Which of the following is a way to establish contact with a digital messaging system gateway station?

A. Send an email to the system control operator

B. Send QRL in Morse code

C. Respond when the station broadcasts its SSID

D. Transmit a connect message on the station's published frequency

G2E11

What is the primary purpose of an Amateur Radio Emergency Data Network (AREDN) mesh network?

A. To provide FM repeater coverage in remote areas

B. To provide real time propagation data by monitoring amateur radio transmissions worldwide

C. To provide high-speed data services during an emergency or community event

D. To provide DX spotting reports to aid contesters and DXers

G2E11 (C)

What is the primary purpose of an Amateur Radio Emergency Data Network (AREDN) mesh network?

A. To provide FM repeater coverage in remote areas

B. To provide real time propagation data by monitoring amateur radio transmissions worldwide

C. To provide high-speed data services during an emergency or community event

D. To provide DX spotting reports to aid contesters and DXers

G2E12

Which of the following describes Winlink?

A. An amateur radio wireless network to send and receive email on the internet

B. A form of Packet Radio

C. A wireless network capable of both VHF and HF band operation

D. All these choices are correct

G2E12 (D)

Which of the following describes Winlink?

A. An amateur radio wireless network to send and receive email on the internet

B. A form of Packet Radio

C. A wireless network capable of both VHF and HF band operation

D. All these choices are correct

G2E13

What is another name for a Winlink Remote Message Server?

A. Terminal Node Controller

B. Gateway

C. RJ-45

D. Printer/Server

G2E13 (B)

What is another name for a Winlink Remote Message Server?

A. Terminal Node Controller

B. Gateway

C. RJ-45

D. Printer/Server

G2E14

What could be wrong if you cannot decode an RTTY or other FSK signal even though it is apparently tuned in properly?

A. The mark and space frequencies may be reversed

B. You may have selected the wrong baud rate

C. You may be listening on the wrong sideband

D. All these choices are correct

G2E14 (D)

What could be wrong if you cannot decode an RTTY or other FSK signal even though it is apparently tuned in properly?

A. The mark and space frequencies may be reversed

B. You may have selected the wrong baud rate

C. You may be listening on the wrong sideband

D. All these choices are correct

G2E15

Which of the following is a common location for FT8?

A. Anywhere in the voice portion of the band

B. Anywhere in the CW portion of the band

C. Approximately 14.074 MHz to 14.077 MHz

D. Approximately 14.110 MHz to 14.113 MHz

G2E15 (C)

Which of the following is a common location for FT8?

A. Anywhere in the voice portion of the band

B. Anywhere in the CW portion of the band

C. Approximately 14.074 MHz to 14.077 MHz

D. Approximately 14.110 MHz to 14.113 MHz

SUBELEMENT G3 – RADIO WAVE PROPAGATION

[3 Exam Questions – 3 Groups]

G3A – Sunspots and solar radiation; geomagnetic field and stability indices

G3A01
How does a higher sunspot number affect HF propagation?

A. Higher sunspot numbers generally indicate a greater probability of good propagation at higher frequencies

B. Lower sunspot numbers generally indicate greater probability of sporadic E propagation

C. A zero sunspot number indicates that radio propagation is not possible on any band

D. A zero sunspot number indicates undisturbed conditions

G3A01 (A)

How does a higher sunspot number affect HF propagation?

A. Higher sunspot numbers generally indicate a greater probability of good propagation at higher frequencies

B. Lower sunspot numbers generally indicate greater probability of sporadic E propagation

C. A zero sunspot number indicates that radio propagation is not possible on any band

D. A zero sunspot number indicates undisturbed conditions

G3A02

What effect does a sudden ionospheric disturbance have on the daytime ionospheric propagation?

A. It enhances propagation on all HF frequencies

B. It disrupts signals on lower frequencies more than those on higher frequencies

C. It disrupts communications via satellite more than direct communications

D. None, because only areas on the night side of the Earth are affected

G3A02 (B)

What effect does a sudden ionospheric disturbance have on the daytime ionospheric propagation?

A. It enhances propagation on all HF frequencies

B. It disrupts signals on lower frequencies more than those on higher frequencies

C. It disrupts communications via satellite more than direct communications

D. None, because only areas on the night side of the Earth are affected

G3A03

Approximately how long does it take the increased ultraviolet and X-ray radiation from a solar flare to affect radio propagation on Earth?

A. 28 days

B. 1 to 2 hours

C. 8 minutes

D. 20 to 40 hours

G3A03 (C)

Approximately how long does it take the increased ultraviolet and X-ray radiation from a solar flare to affect radio propagation on Earth?

A. 28 days

B. 1 to 2 hours

C. 8 minutes

D. 20 to 40 hours

G3A04

Which of the following are the least reliable bands for long-distance communications during periods of low solar activity?

A. 80 meters and 160 meters

B. 60 meters and 40 meters

C. 30 meters and 20 meters

D. 15 meters, 12 meters, and 10 meters

G3A04 (D)

Which of the following are the least reliable bands for long-distance communications during periods of low solar activity?

A. 80 meters and 160 meters

B. 60 meters and 40 meters

C. 30 meters and 20 meters

D. 15 meters, 12 meters, and 10 meters

G3A05
What is the solar flux index?

A. A measure of the highest frequency that is useful for ionospheric propagation between two points on Earth

B. A count of sunspots that is adjusted for solar emissions

C. Another name for the American sunspot number

D. A measure of solar radiation with a wavelength of 10.7 centimeters

G3A05 (D)

What is the solar flux index?

A. A measure of the highest frequency that is useful for ionospheric propagation between two points on Earth

B. A count of sunspots that is adjusted for solar emissions

C. Another name for the American sunspot number

D. A measure of solar radiation with a wavelength of 10.7 centimeters

G3A06

What is a geomagnetic storm?

A. A sudden drop in the solar flux index

B. A thunderstorm that affects radio propagation

C. Ripples in the geomagnetic force

D. A temporary disturbance in Earth’s geomagnetic field

G3A06 (D)

What is a geomagnetic storm?

A. A sudden drop in the solar flux index

B. A thunderstorm that affects radio propagation

C. Ripples in the geomagnetic force

D. A temporary disturbance in Earth's geomagnetic field

G3A07

At what point in the solar cycle does the 20-meter band usually support worldwide propagation during daylight hours?

A. At the summer solstice

B. Only at the maximum point

C. Only at the minimum point

D. At any point

G3A07 (D)

At what point in the solar cycle does the 20-meter band usually support worldwide propagation during daylight hours?

A. At the summer solstice

B. Only at the maximum point

C. Only at the minimum point

D. At any point

G3A08

How can a geomagnetic storm affect HF propagation?

A. Improve high-latitude HF propagation

B. Degrade ground wave propagation

C. Improve ground wave propagation

D. Degrade high-latitude HF propagation

G3A08 (D)

How can a geomagnetic storm affect HF propagation?

A. Improve high-latitude HF propagation

B. Degrade ground wave propagation

C. Improve ground wave propagation

D. Degrade high-latitude HF propagation

G3A09

How can high geomagnetic activity benefit radio communications?

A. Creates auroras that can reflect VHF signals

B. Increases signal strength for HF signals passing through the polar regions

C. Improve HF long path propagation

D. Reduce long delayed echoes

G3A09 (A)

How can high geomagnetic activity benefit radio communications?

A. Creates auroras that can reflect VHF signals

B. Increases signal strength for HF signals passing through the polar regions

C. Improve HF long path propagation

D. Reduce long delayed echoes

G3A10

What causes HF propagation conditions to vary periodically in a 26- to 28-day cycle?

A. Long term oscillations in the upper atmosphere

B. Cyclic variation in Earth’s radiation belts

C. Rotation of the Sun’s surface layers around its axis

D. The position of the Moon in its orbit

G3A10 (C)

What causes HF propagation conditions to vary periodically in a 26- to 28-day cycle?

A. Long term oscillations in the upper atmosphere

B. Cyclic variation in Earth's radiation belts

C. Rotation of the Sun's surface layers around its axis

D. The position of the Moon in its orbit

G3A11

How long does it take a coronal mass ejection to affect radio propagation on Earth?

A. 28 days

B. 14 days

C. 4 to 8 minutes

D. 15 hours to several days

G3A11 (D)

How long does it take a coronal mass ejection to affect radio propagation on Earth?

A. 28 days

B. 14 days

C. 4 to 8 minutes

D. 15 hours to several days

G3A12

What does the K-index measure?

A. The relative position of sunspots on the surface of the Sun

B. The short-term stability of Earth’s geomagnetic field

C. The short-term stability of the Sun’s magnetic field

D. The solar radio flux at Boulder, Colorado

G3A12 (B)

What does the K-index measure?

A. The relative position of sunspots on the surface of the Sun

B. The short-term stability of Earth’s geomagnetic field

C. The short-term stability of the Sun’s magnetic field

D. The solar radio flux at Boulder, Colorado

G3A13

What does the A-index measure?

A. The relative position of sunspots on the surface of the Sun

B. The amount of polarization of the Sun’s electric field

C. The long-term stability of Earth’s geomagnetic field

D. The solar radio flux at Boulder, Colorado

G3A13 (C)

What does the A-index measure?

A. The relative position of sunspots on the surface of the Sun

B. The amount of polarization of the Sun’s electric field

C. The long-term stability of Earth’s geomagnetic field

D. The solar radio flux at Boulder, Colorado

G3A14

How is long distance radio communication usually affected by the charged particles that reach Earth from solar coronal holes?

A. HF communication is improved

B. HF communication is disturbed

C. VHF/UHF ducting is improved

D. VHF/UHF ducting is disturbed

G3A14 (B)

How is long distance radio communication usually affected by the charged particles that reach Earth from solar coronal holes?

A. HF communication is improved

B. HF communication is disturbed

C. VHF/UHF ducting is improved

D. VHF/UHF ducting is disturbed

G3B – Maximum Usable Frequency;
Lowest Usable Frequency; short path and long path propagation; determining propagation conditions; ionospheric refraction

G3B01

What is a characteristic of skywave signals arriving at your location by both short-path and long-path Propagation?

A. Periodic fading approximately every 10 seconds
B. Signal strength increased by 3 dB
C. The signal might be cancelled causing severe attenuation
D. A slightly delayed echo might be heard

G3B01 (D)

What is a characteristic of skywave signals arriving at your location by both short-path and long-path Propagation?

A. Periodic fading approximately every 10 seconds

B. Signal strength increased by 3 dB

C. The signal might be cancelled causing severe attenuation

D. A slightly delayed echo might be heard

G3B02

What factors affect the MUF?

A. Path distance and location

B. Time of day and season

C. Solar radiation and ionospheric disturbances

D. All these choices are correct

G3B02 (D)

What factors affect the MUF?

A. Path distance and location

B. Time of day and season

C. Solar radiation and ionospheric disturbances

D. All these choices are correct

G3B03

Which frequency will have the least attenuation for long-distance skip propagation?

A. Just below the MUF
B. Just above the LUF
C. Just below the critical frequency
D. Just above the critical frequency

G3B03 (A)

Which frequency will have the least attenuation for long-distance skip propagation?

<u>A. Just below the MUF</u>

B. Just above the LUF

C. Just below the critical frequency

D. Just above the critical frequency

G3B04

Which of the following is a way to determine current propagation on a desired band from your station?

A. Use a network of automated receiving stations on the internet to see where your transmissions are being received

B. Check the A-index

C. Send a series of dots and listen for echoes

D. All these choices are correct

G3B04 (A)

Which of the following is a way to determine current propagation on a desired band from your station?

A. Use a network of automated receiving stations on the internet to see where your transmissions are being received

B. Check the A-index

C. Send a series of dots and listen for echoes

D. All these choices are correct

G3B05

How does the ionosphere affect radio waves with frequencies below the MUF and above the LUF?

A. They are refracted back to Earth

B. They pass through the ionosphere

C. They are amplified by interaction with the ionosphere

D. They are refracted and trapped in the ionosphere to circle Earth

G3B05 (A)

How does the ionosphere affect radio waves with frequencies below the MUF and above the LUF?

A. They are refracted back to Earth

B. They pass through the ionosphere

C. They are amplified by interaction with the ionosphere

D. They are refracted and trapped in the ionosphere to circle Earth

G3B06

What usually happens to radio waves with frequencies below the LUF?

A. They are refracted back to Earth

B. They pass through the ionosphere

C. They are attenuated before reaching the destination

D. They are refracted and trapped in the ionosphere to circle Earth

G3B06 (C)

What usually happens to radio waves with frequencies below the LUF?

A. They are refracted back to Earth

B. They pass through the ionosphere

C. They are attenuated before reaching the destination

D. They are refracted and trapped in the ionosphere to circle Earth

G3B07

What does LUF stand for?

A. The Lowest Usable Frequency for communications between two specific points

B. Lowest Usable Frequency for communications to any point outside a 100-mile radius

C. The Lowest Usable Frequency during a 24-hour period

D. Lowest Usable Frequency during the past 60 minutes

G3B07 (A)

What does LUF stand for?

A. The Lowest Usable Frequency for communications between two specific points

B. Lowest Usable Frequency for communications to any point outside a 100-mile radius

C. The Lowest Usable Frequency during a 24-hour period

D. Lowest Usable Frequency during the past 60 minutes

G3B08

What does MUF stand for?

A. The Minimum Usable Frequency for communications between two points

B. The Maximum Usable Frequency for communications between two points

C. The Minimum Usable Frequency during a 24-hour period

D. The Maximum Usable Frequency during a 24-hour period

G3B08 (B)

What does MUF stand for?

A. The Minimum Usable Frequency for communications between two points

B. The Maximum Usable Frequency for communications between two points

C. The Minimum Usable Frequency during a 24-hour period

D. The Maximum Usable Frequency during a 24-hour period

G3B09

What is the approximate maximum distance along the Earth’s surface normally covered in one hop using the F2 region?

A. 180 miles

B. 1,200 miles

C. 2,500 miles

D. 12,000 miles

G3B09 (C)

What is the approximate maximum distance along the Earth's surface normally covered in one hop using the F2 region?

A. 180 miles

B. 1,200 miles

C. 2,500 miles

D. 12,000 miles

G3B10

What is the approximate maximum distance along the Earth's surface normally covered in one hop using the E region?

A. 180 miles

B. 1,200 miles

C. 2,500 miles

D. 12,000 miles

G3B10 (B)

What is the approximate maximum distance along the Earth's surface normally covered in one hop using the E region?

A. 180 miles

B. 1,200 miles

C. 2,500 miles

D. 12,000 miles

G3B11

What happens to HF propagation when the LUF exceeds the MUF?

A. Propagation via ordinary skywave communications is not possible over that path

B. HF communications over the path are enhanced

C. Double-hop propagation along the path is more common

D. Propagation over the path on all HF frequencies is enhanced

G3B11 (A)

What happens to HF propagation when the LUF exceeds the MUF?

A. Propagation via ordinary skywave communications is not possible over that path

B. HF communications over the path are enhanced

C. Double-hop propagation along the path is more common

D. Propagation over the path on all HF frequencies is enhanced

G3B12

Which of the following is typical of the lower HF frequencies during the summer?

A. Poor propagation at any time of day

B. World-wide propagation during daylight hours

C. Heavy distortion on signals due to photon absorption

D. High levels of atmospheric noise or static

G3B12 (D)

Which of the following is typical of the lower HF frequencies during the summer?

A. Poor propagation at any time of day

B. World-wide propagation during daylight hours

C. Heavy distortion on signals due to photon absorption

D. High levels of atmospheric noise or static

G3C – Ionospheric regions; critical angle and frequency; HF scatter; near vertical incidence skywave (NVIS)

G3C01

Which ionospheric region is closest to the surface of Earth?

A. The D region

B. The E region

C. The F1 region

D. The F2 region

G3C01 (A)

Which ionospheric region is closest to the surface of Earth?

A. The D region

B. The E region

C. The F1 region

D. The F2 region

G3C02

What is meant by the term “critical frequency” at a given incidence angle?

A. The highest frequency which is refracted back to Earth

B. The lowest frequency which is refracted back to Earth

C. The frequency at which the signal-to-noise ratio approaches unity

D. The frequency at which the signal-to-noise ratio is 6 dB

G3C02 (A)

What is meant by the term "critical frequency" at a given incidence angle?

A. The highest frequency which is refracted back to Earth

B. The lowest frequency which is refracted back to Earth

C. The frequency at which the signal-to-noise ratio approaches unity

D. The frequency at which the signal-to-noise ratio is 6 dB

G3C03

Why is skip propagation via the F2 region longer than that via the other ionospheric regions?

A. Because it is the densest

B. Because of the Doppler effect

C. Because it is the highest

D. Because of temperature inversions

G3C03 (C)

Why is skip propagation via the F2 region longer than that via the other ionospheric regions?

A. Because it is the densest

B. Because of the Doppler effect

C. Because it is the highest

D. Because of temperature inversions

G3C04

What does the term “critical angle” mean, as applied to radio wave propagation?

A. The long path azimuth of a distant station

B. The short path azimuth of a distant station

C. The lowest takeoff angle that will return a radio wave to Earth under specific ionospheric conditions

D. The highest takeoff angle that will return a radio wave to Earth under specific ionospheric conditions

G3C04 (D)

What does the term “critical angle” mean, as applied to radio wave propagation?

A. The long path azimuth of a distant station

B. The short path azimuth of a distant station

C. The lowest takeoff angle that will return a radio wave to Earth under specific ionospheric conditions

D. The highest takeoff angle that will return a radio wave to Earth under specific ionospheric conditions

G3C05

Why is long-distance communication on the 40-, 60-, 80-, and 160-meter bands more difficult during the day?

A. The F region absorbs signals at these frequencies during daylight hours

B. The F region is unstable during daylight hours

C. The D region absorbs signals at these frequencies during daylight hours

D. The E region is unstable during daylight hours

G3C05 (C)

Why is long-distance communication on the 40-, 60-, 80-, and 160-meter bands more difficult during the day?

A. The F region absorbs signals at these frequencies during daylight hours

B. The F region is unstable during daylight hours

<u>C. The D region absorbs signals at these frequencies during daylight hours</u>

D. The E region is unstable during daylight hours

G3C06

What is a characteristic of HF scatter?

A. Phone signals have high intelligibility

B. Signals have a fluttering sound

C. There are very large, sudden swings in signal strength

D. Scatter propagation occurs only at night

G3C06 (B)

What is a characteristic of HF scatter?

A. Phone signals have high intelligibility

B. Signals have a fluttering sound

C. There are very large, sudden swings in signal strength

D. Scatter propagation occurs only at night

G3C07

What makes HF scatter signals often sound distorted?

A. The ionospheric region involved is unstable

B. Ground waves are absorbing much of the signal

C. The E region is not present

D. Energy is scattered into the skip zone through several different paths

G3C07 (D)

What makes HF scatter signals often sound distorted?

A. The ionospheric region involved is unstable

B. Ground waves are absorbing much of the signal

C. The E region is not present

D. Energy is scattered into the skip zone through several different paths

G3C08

Why are HF scatter signals in the skip zone usually weak?

A. Only a small part of the signal energy is scattered into the skip zone

B. Signals are scattered from the magnetosphere, which is not a good reflector

C. Propagation is via ground waves, which absorb most of the signal energy

D. Propagation is via ducts in the F region, which absorb most of the energy

G3C08 (A)
Why are HF scatter signals in the skip zone usually weak?

A. Only a small part of the signal energy is scattered into the skip zone

B. Signals are scattered from the magnetosphere, which is not a good reflector

C. Propagation is via ground waves, which absorb most of the signal energy

D. Propagation is via ducts in the F region, which absorb most of the energy

G3C09

What type of propagation allows signals to be heard in the transmitting station's skip zone?

A. Faraday rotation

B. Scatter

C. Chordal hop

D. Short-path

G3C09 (B)

What type of propagation allows signals to be heard in the transmitting station's skip zone?

A. Faraday rotation

B. Scatter

C. Chordal hop

D. Short-path

G3C10

What is near vertical incidence skywave (NVIS) propagation?

A. Propagation near the MUF

B. Short distance MF or HF propagation at high elevation angles

C. Long path HF propagation at sunrise and sunset

D. Double hop propagation near the LUF

G3C10 (B)

What is near vertical incidence skywave (NVIS) propagation?

A. Propagation near the MUF

B. Short distance MF or HF propagation at high elevation angles

C. Long path HF propagation at sunrise and sunset

D. Double hop propagation near the LUF

G3C11

Which ionospheric region is the most absorbent of signals below 10 MHz during daylight hours?

A. The F2 region

B. The F1 region

C. The E region

D. The D region

G3C11 (D)

Which ionospheric region is the most absorbent of signals below 10 MHz during daylight hours?

A. The F2 region

B. The F1 region

C. The E region

D. The D region

SUBELEMENT G4 – AMATEUR RADIO PRACTICES

[5 Exam Questions – 5 groups]

G4A – Station configuration and operation

G4A01

What is the purpose of the notch filter found on many HF transceivers?

A. To restrict the transmitter voice bandwidth

B. To reduce interference from carriers in the receiver passband

C. To eliminate receiver interference from impulse noise sources

D. To remove interfering splatter generated by signals on adjacent frequencies

G4A01 (B)

What is the purpose of the notch filter found on many HF transceivers?

A. To restrict the transmitter voice bandwidth

B. To reduce interference from carriers in the receiver passband

C. To eliminate receiver interference from impulse noise sources

D. To remove interfering splatter generated by signals on adjacent frequencies

G4A02

What is the benefit of using the opposite or “reverse” sideband when receiving CW?

A. Interference from impulse noise will be eliminated

B. More stations can be accommodated within a given signal passband

C. It may be possible to reduce or eliminate interference from other signals

D. Accidental out-of-band operation can be prevented

G4A02 (C)

What is the benefit of using the opposite or “reverse” sideband when receiving CW?

A. Interference from impulse noise will be eliminated

B. More stations can be accommodated within a given signal passband

C. It may be possible to reduce or eliminate interference from other signals

D. Accidental out-of-band operation can be prevented

G4A03

How does a noise blanker work?

A. By temporarily increasing received bandwidth

B. By redirecting noise pulses into a filter capacitor

C. By reducing receiver gain during a noise pulse

D. By clipping noise peaks

G4A03 (C)

How does a noise blanker work?

A. By temporarily increasing received bandwidth

B. By redirecting noise pulses into a filter capacitor

C. By reducing receiver gain during a noise pulse

D. By clipping noise peaks

G4A04

What is the effect on plate current of the correct setting of a vacuum-tube RF power amplifier's TUNE control?

A. A pronounced peak

B. A pronounced dip

C. No change will be observed

D. A slow, rhythmic oscillation

G4A04 (B)

What is the effect on plate current of the correct setting of a vacuum-tube RF power amplifier's TUNE control?

A. A pronounced peak

B. A pronounced dip

C. No change will be observed

D. A slow, rhythmic oscillation

G4A05

Why is automatic level control (ALC) used with an RF power amplifier?

A. To balance the transmitter audio frequency response

B. To reduce harmonic radiation

C. To prevent excessive drive

D. To increase overall efficiency

G4A05 (C)

Why is automatic level control (ALC) used with an RF power amplifier?

A. To balance the transmitter audio frequency response

B. To reduce harmonic radiation

C. To prevent excessive drive

D. To increase overall efficiency

G4A06

What is the purpose of an antenna tuner?

A. Reduce the SWR in the feed line to the antenna

B. Reduce the power dissipation in the feedline to the antenna

C. Increase power transfer from the transmitter to the feed line

D. All these choices are correct

G4A06 (C)

What is the purpose of an antenna tuner?

A. Reduce the SWR in the feed line to the antenna

B. Reduce the power dissipation in the feedline to the antenna

C. Increase power transfer from the transmitter to the feed line

D. All these choices are correct

G4A07

What happens as a receiver's noise reduction control level is increased?

A. Received signals may become distorted

B. Received frequency may become unstable

C. CW signals may become severely attenuated

D. Received frequency may shift several kHz

G4A07 (A)

What happens as a receiver's noise reduction control level is increased?

A. Received signals may become distorted

B. Received frequency may become unstable

C. CW signals may become severely attenuated

D. Received frequency may shift several kHz

G4A08

What is the correct adjustment for the LOAD or COUPLING control of a vacuum tube RF power amplifier?

A. Minimum SWR on the antenna

B. Minimum plate current without exceeding maximum allowable grid current

C. Highest plate voltage while minimizing grid current

D. Desired power output without exceeding maximum allowable plate current

G4A08 (D)

What is the correct adjustment for the LOAD or COUPLING control of a vacuum tube RF power amplifier?

A. Minimum SWR on the antenna

B. Minimum plate current without exceeding maximum allowable grid current

C. Highest plate voltage while minimizing grid current

D. Desired power output without exceeding maximum allowable plate current

G4A09

What is the purpose of delaying RF output after activating a transmitter's keying line to an external amplifier?

A. To prevent key clicks on CW

B. To prevent transient overmodulation

C. To allow time for the amplifier to switch the antenna between the transceiver and the amplifier output

D. To allow time for the amplifier power supply to reach operating level

G4A09 (C)

What is the purpose of delaying RF output after activating a transmitter's keying line to an external amplifier?

A. To prevent key clicks on CW

B. To prevent transient overmodulation

C. To allow time for the amplifier to switch the antenna between the transceiver and the amplifier output

D. To allow time for the amplifier power supply to reach operating level

G4A10

What is the function of an electronic keyer?

A. Automatic transmit/receive switching

B. Automatic generation of dots and dashes for CW operation

C. To allow time for switching the antenna from the receiver to the transmitter

D. Computer interface for PSK and RTTY operation

G4A10 (B)

What is the function of an electronic keyer?

A. Automatic transmit/receive switching

B. Automatic generation of dots and dashes for CW operation

C. To allow time for switching the antenna from the receiver to the transmitter

D. Computer interface for PSK and RTTY operation

G4A11

Why should the ALC system be inactive when transmitting AFSK data signals?

A. ALC will invert the modulation of the AFSK mode

B. The ALC action distorts the signal

C. When using digital modes, too much ALC activity can cause the transmitter to overheat

D. All these choices are correct

G4A11 (B)

Why should the ALC system be inactive when transmitting AFSK data signals?

A. ALC will invert the modulation of the AFSK mode

B. The ALC action distorts the signal

C. When using digital modes, too much ALC activity can cause the transmitter to overheat

D. All these choices are correct

G4A12

Which of the following is a common use of the dual-VFO feature on a transceiver?

A. To allow transmitting on two frequencies at once

B. To permit full duplex operation -- that is, transmitting and receiving at the same time

C. To transmit on one frequency and listen on another

D. To improve frequency accuracy by allowing variable frequency output (VFO) operation

G4A12 (C)

Which of the following is a common use of the dual-VFO feature on a transceiver?

A. To allow transmitting on two frequencies at once

B. To permit full duplex operation -- that is, transmitting and receiving at the same time

C. To transmit on one frequency and listen on another

D. To improve frequency accuracy by allowing variable frequency output (VFO) operation

G4A13

What is the purpose of using a receive attenuator?

A. To prevent receiver overload from strong incoming signals

B. To reduce the transmitter power when driving a linear amplifier

C. To reduce power consumption when operating from batteries

D. To reduce excessive audio level on strong signals

G4A13 (A)

What is the purpose of using a receive attenuator?

A. To prevent receiver overload from strong incoming signals

B. To reduce the transmitter power when driving a linear amplifier

C. To reduce power consumption when operating from batteries

D. To reduce excessive audio level on strong signals

G4B – Tests and test equipment

G4B01

What item of test equipment contains horizontal and vertical channel amplifiers?

A. An ohmmeter
B. A signal generator
C. An ammeter
D. An oscilloscope

G4B01 (D)

What item of test equipment contains horizontal and vertical channel amplifiers?

A. An ohmmeter

B. A signal generator

C. An ammeter

D. An oscilloscope

G4B02

Which of the following is an advantage of an oscilloscope versus a digital voltmeter?

A. An oscilloscope uses less power
B. Complex impedances can be easily measured
C. Greater precision
D. Complex waveforms can be measured

G4B02 (D)

Which of the following is an advantage of an oscilloscope versus a digital voltmeter?

A. An oscilloscope uses less power

B. Complex impedances can be easily measured

C. Greater precision

D. Complex waveforms can be measured

G4B03

Which of the following is the best instrument to use for checking the keying waveform of a CW transmitter?

A. An oscilloscope
B. A field strength meter
C. A sidetone monitor
D. A wavemeter

G4B03 (A)

Which of the following is the best instrument to use for checking the keying waveform of a CW transmitter?

A. An oscilloscope

B. A field strength meter

C. A sidetone monitor

D. A wavemeter

G4B04

What signal source is connected to the vertical input of an oscilloscope when checking the RF envelope pattern of a transmitted signal?

A. The local oscillator of the transmitter
B. An external RF oscillator
C. The transmitter balanced mixer output
D. The attenuated RF output of the transmitter

G4B04 (D)

What signal source is connected to the vertical input of an oscilloscope when checking the RF envelope pattern of a transmitted signal?

A. The local oscillator of the transmitter

B. An external RF oscillator

C. The transmitter balanced mixer output

D. The attenuated RF output of the transmitter

G4B05

Why do voltmeters have high input impedance?

A. It improves the frequency response

B. It allows for higher voltages to be safely measured

C. It improves the resolution of the readings

D. It decreases the loading on circuits being measured

G4B05 (D)
Why do voltmeters have high input impedance?

A. It improves the frequency response

B. It allows for higher voltages to be safely measured

C. It improves the resolution of the readings

D. It decreases the loading on circuits being measured

G4B06

What is an advantage of a digital multimeter as compared to an analog multimeter?

A. Better for measuring computer circuits

B. Less prone to overload

C. Higher precision

D. Faster response

G4B06 (C)

What is an advantage of a digital multimeter as compared to an analog multimeter?

A. Better for measuring computer circuits

B. Less prone to overload

C. Higher precision

D. Faster response

G4B07

What signals are used to conduct a two-tone test?

A. Two audio signals of the same frequency shifted 90 degrees

B. Two non-harmonically related audio signals

C. Two swept frequency tones

D. Two audio frequency range square wave signals of equal amplitude

G4B07 (B)

What signals are used to conduct a two-tone test?

A. Two audio signals of the same frequency shifted 90 degrees

B. Two non-harmonically related audio signals

C. Two swept frequency tones

D. Two audio frequency range square wave signals of equal amplitude

G4B08

What transmitter performance parameter does a two-tone test analyze?

A. Linearity

B. Percentage of suppression of the carrier and undesired sideband for SSB

C. Percentage of frequency modulation

D. Percentage of carrier phase shift

G4B08 (A)

What transmitter performance parameter does a two-tone test analyze?

A. Linearity

B. Percentage of suppression of the carrier and undesired sideband for SSB

C. Percentage of frequency modulation

D. Percentage of carrier phase shift

G4B09

When is an analog multimeter preferred to a digital multimeter?

A. When testing logic circuits

B. When high precision is desired

C. When measuring the frequency of an oscillator

D. When adjusting circuits for maximum or minimum values

G4B09 (D)

When is an analog multimeter preferred to a digital multimeter?

A. When testing logic circuits

B. When high precision is desired

C. When measuring the frequency of an oscillator

D. When adjusting circuits for maximum or minimum values

G4B10

Which of the following can be determined with a directional wattmeter?

A. Standing wave ratio
B. Antenna front-to-back ratio
C. RF interference
D. Radio wave propagation

G4B10 (A)

Which of the following can be determined with a directional wattmeter?

A. Standing wave ratio

B. Antenna front-to-back ratio

C. RF interference

D. Radio wave propagation

G4B11

Which of the following must be connected to an antenna analyzer when it is being used for SWR measurements?

A. Receiver

B. Transmitter

C. Antenna and feed line

D. All these choices are correct

G4B11 (C)

Which of the following must be connected to an antenna analyzer when it is being used for SWR measurements?

A. Receiver

B. Transmitter

C. Antenna and feed line

D. All these choices are correct

G4B12

What effect can strong signals from nearby transmitters have on an antenna analyzer?

A. Desensitization which can cause intermodulation products which interfere with impedance readings

B. Received power that interferes with SWR readings

C. Generation of harmonics which interfere with frequency readings

D. All these choices are correct

G4B12 (B)

What effect can strong signals from nearby transmitters have on an antenna analyzer?

A. Desensitization which can cause intermodulation products which interfere with impedance readings

B. Received power that interferes with SWR readings

C. Generation of harmonics which interfere with frequency readings

D. All these choices are correct

G4B13

Which of the following can be measured with an antenna analyzer?

A. Front-to-back ratio of an antenna

B. Power output from a transmitter

C. Impedance of coaxial cable

D. Gain of a directional antenna

G4B13 (C)

Which of the following can be measured with an antenna analyzer?

A. Front-to-back ratio of an antenna

B. Power output from a transmitter

C. Impedance of coaxial cable

D. Gain of a directional antenna

G4C – Interference to consumer electronics; grounding and bonding

G4C01

Which of the following might be useful in reducing RF interference to audio frequency circuits?

A. Bypass inductor

B. Bypass capacitor

C. Forward-biased diode

D. Reverse-biased diode

G4C01 (B)

Which of the following might be useful in reducing RF interference to audio frequency circuits?

A. Bypass inductor

B. Bypass capacitor

C. Forward-biased diode

D. Reverse-biased diode

G4C02

Which of the following could be a cause of interference covering a wide range of frequencies?

A. Not using a balun or line isolator to feed balanced antennas

B. Lack of rectification of the transmitter's signal in power conductors

C. Arcing at a poor electrical connection

D. Using a balun to feed an unbalanced antenna

G4C02 (C)

Which of the following could be a cause of interference covering a wide range of frequencies?

A. Not using a balun or line isolator to feed balanced antennas

B. Lack of rectification of the transmitter's signal in power conductors

C. Arcing at a poor electrical connection

D. Using a balun to feed an unbalanced antenna

G4C03

What sound is heard from an audio device experiencing RF interference from a single sideband phone transmitter?

A. A steady hum whenever the transmitter is on the air

B. On-and-off humming or clicking

C. Distorted speech

D. Clearly audible speech

G4C03 (C)

What sound is heard from an audio device experiencing RF interference from a single sideband phone transmitter?

A. A steady hum whenever the transmitter is on the air

B. On-and-off humming or clicking

C. Distorted speech

D. Clearly audible speech

G4C04

What sound is heard from an audio device experiencing RF interference from a CW transmitter?

A. On-and-off humming or clicking

B. A CW signal at a nearly pure audio frequency

C. A chirpy CW signal

D. Severely distorted audio

G4C04 (A)

What sound is heard from an audio device experiencing RF interference from a CW transmitter?

A. On-and-off humming or clicking

B. A CW signal at a nearly pure audio frequency

C. A chirpy CW signal

D. Severely distorted audio

G4C05

What is a possible cause of high voltages that produce RF burns?

A. Flat braid rather than round wire has been used for the ground wire

B. Insulated wire has been used for the ground wire

C. The ground rod is resonant

D. The ground wire has high impedance on that frequency

G4C05 (D)

What is a possible cause of high voltages that produce RF burns?

A. Flat braid rather than round wire has been used for the ground wire

B. Insulated wire has been used for the ground wire

C. The ground rod is resonant

D. The ground wire has high impedance on that frequency

G4C06

What is a possible effect of a resonant ground connection?

A. Overheating of ground straps

B. Corrosion of the ground rod

C. High RF voltages on the enclosures of station equipment

D. A ground loop

G4C06 (C)

What is a possible effect of a resonant ground connection?

A. Overheating of ground straps

B. Corrosion of the ground rod

C. High RF voltages on the enclosures of station equipment

D. A ground loop

G4C07

Why should soldered joints not be used in lightning protection ground connections?

A. A soldered joint will likely be destroyed by the heat of a lightning strike

B. Solder flux will prevent a low conductivity connection

C. Solder has too high a dielectric constant to provide adequate lightning protection

D. All these choices are correct

G4C07 (A)

Why should soldered joints not be used in lightning protection ground connections?

<u>A. A soldered joint will likely be destroyed by the heat of a lightning strike</u>

B. Solder flux will prevent a low conductivity connection

C. Solder has too high a dielectric constant to provide adequate lightning protection

D. All these choices are correct

G4C08

Which of the following would reduce RF interference caused by common-mode current on an audio cable?

A. Place a ferrite choke on the cable

B. Connect the center conductor to the shield of all cables to short circuit the RFI signal

C. Ground the center conductor of the audio cable causing the interference

D. Add an additional insulating jacket to the cable

G4C08 (A)

Which of the following would reduce RF interference caused by common-mode current on an audio cable?

A. Place a ferrite choke on the cable

B. Connect the center conductor to the shield of all cables to short circuit the RFI signal

C. Ground the center conductor of the audio cable causing the interference

D. Add an additional insulating jacket to the cable

G4C09

How can the effects of ground loops be minimized?

A. Connect all ground conductors in series

B. Connect the AC neutral conductor to the ground wire

C. Avoid using lock washers and star washers when making ground connections

D. Bond equipment enclosures together

G4C09 (D)
How can the effects of ground loops be minimized?

A. Connect all ground conductors in series

B. Connect the AC neutral conductor to the ground wire

C. Avoid using lock washers and star washers when making ground connections

D. Bond equipment enclosures together

G4C10

What could be a symptom caused by a ground loop in your station's audio connections?

A. You receive reports of "hum" on your station's transmitted signal

B. The SWR reading for one or more antennas is suddenly very high

C. An item of station equipment starts to draw excessive amounts of current

D. You receive reports of harmonic interference from your station

G4C10 (A)

What could be a symptom caused by a ground loop in your station's audio connections?

A. You receive reports of "hum" on your station's transmitted signal

B. The SWR reading for one or more antennas is suddenly very high

C. An item of station equipment starts to draw excessive amounts of current

D. You receive reports of harmonic interference from your station

G4C11

What technique helps to minimize RF “hot spots” in an amateur station?

A. Building all equipment in a metal enclosure

B. Using surge suppressor power outlets

C. Bonding all equipment enclosures together

D. Placing low-pass filters on all feed lines

G4C11 (C)

What technique helps to minimize RF "hot spots" in an amateur station?

A. Building all equipment in a metal enclosure

B. Using surge suppressor power outlets

C. Bonding all equipment enclosures together

D. Placing low-pass filters on all feed lines

G4D – Speech processors; S meters; sideband operation near band edges

G4D01

What is the purpose of a speech processor in a transceiver?

A. Increase the apparent loudness of transmitted voice signals

B. Increase transmitter bass response for more natural-sounding SSB signals

C. Prevent distortion of voice signals

D. Decrease high-frequency voice output to prevent out-of-band operation

G4D01 (A)

What is the purpose of a speech processor in a transceiver?

A. Increase the apparent loudness of transmitted voice signals

B. Increase transmitter bass response for more natural-sounding SSB signals

C. Prevent distortion of voice signals

D. Decrease high-frequency voice output to prevent out-of-band operation

G4D02

How does a speech processor affect a single sideband phone signal?

A. It increases peak power

B. It increases average power

C. It reduces harmonic distortion

D. It reduces intermodulation distortion

G4D02 (B)

How does a speech processor affect a single sideband phone signal?

A. It increases peak power

B. It increases average power

C. It reduces harmonic distortion

D. It reduces intermodulation distortion

G4D03

What is the effect of an incorrectly adjusted speech processor?

A. Distorted speech

B. Excess intermodulation products

C. Excessive background noise

D. All these choices are correct

G4D03 (D)

What is the effect of an incorrectly adjusted speech processor?

A. Distorted speech

B. Excess intermodulation products

C. Excessive background noise

D. All these choices are correct

G4D04

What does an S meter measure?

A. Carrier suppression

B. Impedance

C. Received signal strength

D. Transmitter power output

G4D04 (C)

What does an S meter measure?

A. Carrier suppression

B. Impedance

C. Received signal strength

D. Transmitter power output

G4D05

How does a signal that reads 20 dB over S9 compare to one that reads S9 on a receiver, assuming a properly calibrated S meter?

A. It is 10 times less powerful

B. It is 20 times less powerful

C. It is 20 times more powerful

D. It is 100 times more powerful

G4D05 (D)

How does a signal that reads 20 dB over S9 compare to one that reads S9 on a receiver, assuming a properly calibrated S meter?

A. It is 10 times less powerful

B. It is 20 times less powerful

C. It is 20 times more powerful

D. It is 100 times more powerful

G4D06

How much change in signal strength is typically represented by one S unit?

A. 6 dB

B. 12 dB

C. 15 dB

D. 18 dB

G4D06 (A)

How much change in signal strength is typically represented by one S unit?

A. 6 dB

B. 12 dB

C. 15 dB

D. 18 dB

G4D07

How much must the power output of a transmitter be raised to change the S meter reading on a distant receiver from S8 to S9?

A. Approximately 1.5 times

B. Approximately 2 times

C. Approximately 4 times

D. Approximately 8 times

G4D07 (C)

How much must the power output of a transmitter be raised to change the S meter reading on a distant receiver from S8 to S9?

A. Approximately 1.5 times

B. Approximately 2 times

C. Approximately 4 times

D. Approximately 8 times

G4D08

What frequency range is occupied by a 3 kHz LSB signal when the displayed carrier frequency is set to 7.178 MHz?

A. 7.178 MHz to 7.181 MHz

B. 7.178 MHz to 7.184 MHz

C. 7.175 MHz to 7.178 MHz

D. 7.1765 MHz to 7.1795 MHz

G4D08 (C)

What frequency range is occupied by a 3 kHz LSB signal when the displayed carrier frequency is set to 7.178 MHz?

A. 7.178 MHz to 7.181 MHz

B. 7.178 MHz to 7.184 MHz

C. 7.175 MHz to 7.178 MHz

D. 7.1765 MHz to 7.1795 MHz

G4D09

What frequency range is occupied by a 3 kHz USB signal with the displayed carrier frequency set to 14.347 MHz?

A. 14.347 MHz to 14.647 MHz

B. 14.347 MHz to 14.350 MHz

C. 14.344 MHz to 14.347 MHz

D. 14.3455 MHz to 14.3485 MHz

G4D09 (B)

What frequency range is occupied by a 3 kHz USB signal with the displayed carrier frequency set to 14.347 MHz?

A. 14.347 MHz to 14.647 MHz

B. 14.347 MHz to 14.350 MHz

C. 14.344 MHz to 14.347 MHz

D. 14.3455 MHz to 14.3485 MHz

G4D10

How close to the lower edge of a band's phone segment should your displayed carrier frequency be when using 3 kHz wide LSB?

A. At least 3 kHz above the edge of the segment

B. At least 3 kHz below the edge of the segment

C. At least 1 kHz below the edge of the segment

D. At least 1 kHz above the edge of the segment

G4D10 (A)

How close to the lower edge of a band's phone segment should your displayed carrier frequency be when using 3 kHz wide LSB?

A. At least 3 kHz above the edge of the segment

B. At least 3 kHz below the edge of the segment

C. At least 1 kHz below the edge of the segment

D. At least 1 kHz above the edge of the segment

G4D11

How close to the upper edge of a band’s phone segment should your displayed carrier frequency be when using 3 kHz wide USB?

A. At least 3 kHz above the edge of the band

B. At least 3 kHz below the edge of the band

C. At least 1 kHz above the edge of the segment

D. At least 1 kHz below the edge of the segment

G4D11 (B)

How close to the upper edge of a band's phone segment should your displayed carrier frequency be when using 3 kHz wide USB?

A. At least 3 kHz above the edge of the band

B. At least 3 kHz below the edge of the band

C. At least 1 kHz above the edge of the segment

D. At least 1 kHz below the edge of the segment

G4E – Mobile and portable HF stations; alternative energy source operation

G4E01

What is the purpose of a capacitance hat on a mobile antenna?

A. To increase the power handling capacity of a whip antenna

B. To reduce radiation resistance

C. To electrically lengthen a physically short antenna

D. To lower the radiation angle

G4E01 (C)

What is the purpose of a capacitance hat on a mobile antenna?

A. To increase the power handling capacity of a whip antenna

B. To reduce radiation resistance

<u>C. To electrically lengthen a physically short antenna</u>

D. To lower the radiation angle

G4E02

What is the purpose of a corona ball on an HF mobile antenna?

A. To narrow the operating bandwidth of the antenna

B. To increase the “Q” of the antenna

C. To reduce the chance of damage if the antenna should strike an object

D. To reduce RF voltage discharge from the tip of the antenna while transmitting

G4E02 (D)

What is the purpose of a corona ball on an HF mobile antenna?

A. To narrow the operating bandwidth of the antenna

B. To increase the “Q” of the antenna

C. To reduce the chance of damage if the antenna should strike an object

D. To reduce RF voltage discharge from the tip of the antenna while transmitting

G4E03

Which of the following direct, fused power connections would be the best for a 100-watt HF mobile installation?

A. To the battery using heavy-gauge wire

B. To the alternator or generator using heavy-gauge wire

C. To the battery using insulated heavy duty balanced transmission line

D. To the alternator or generator using insulated heavy duty balanced transmission line

G4E03 (A)

Which of the following direct, fused power connections would be the best for a 100-watt HF mobile installation?

A. To the battery using heavy-gauge wire

B. To the alternator or generator using heavy-gauge wire

C. To the battery using insulated heavy duty balanced transmission line

D. To the alternator or generator using insulated heavy duty balanced transmission line

G4E04

Why should DC power for a 100-watt HF transceiver not be supplied by a vehicle's auxiliary power socket?

A. The socket is not wired with an RF-shielded power cable

B. The socket's wiring may be inadequate for the current drawn by the transceiver

C. The DC polarity of the socket is reversed from the polarity of modern HF transceivers

D. Drawing more than 50 watts from this socket could cause the engine to overheat

G4E04 (B)

Why should DC power for a 100-watt HF transceiver not be supplied by a vehicle's auxiliary power socket?

A. The socket is not wired with an RF-shielded power cable

B. The socket's wiring may be inadequate for the current drawn by the transceiver

C. The DC polarity of the socket is reversed from the polarity of modern HF transceivers

D. Drawing more than 50 watts from this socket could cause the engine to overheat

G4E05

Which of the following most limits an HF mobile installation?

A. “Picket fencing”

B. The wire gauge of the DC power line to the transceiver

C. Efficiency of the electrically short antenna

D. FCC rules limiting mobile output power on the 75-meter band

G4E05 (C)

Which of the following most limits an HF mobile installation?

A. “Picket fencing”

B. The wire gauge of the DC power line to the transceiver

C. Efficiency of the electrically short antenna

D. FCC rules limiting mobile output power on the 75-meter band

G4E06

What is one disadvantage of using a shortened mobile antenna as opposed to a full-size antenna?

A. Short antennas are more likely to cause distortion of transmitted signals

B. Q of the antenna will be very low

C. Operating bandwidth may be very limited

D. Harmonic radiation may increase

G4E06 (C)

What is one disadvantage of using a shortened mobile antenna as opposed to a full-size antenna?

A. Short antennas are more likely to cause distortion of transmitted signals

B. Q of the antenna will be very low

C. Operating bandwidth may be very limited

D. Harmonic radiation may increase

G4E07

Which of the following may cause receive interference to an HF transceiver installed in a vehicle?

A. The battery charging system

B. The fuel delivery system

C. The control computers

D. All these choices are correct

G4E07 (D)

Which of the following may cause receive interference to an HF transceiver installed in a vehicle?

A. The battery charging system

B. The fuel delivery system

C. The control computers

D. All these choices are correct

G4E08

In what configuration are the individual cells in a solar panel connected together?

A. Series-parallel

B. Shunt

C. Bypass

D. Full-wave bridge

G4E08 (A)

In what configuration are the individual cells in a solar panel connected together?

A. Series-parallel

B. Shunt

C. Bypass

D. Full-wave bridge

G4E09

What is the approximate open-circuit voltage from a fully illuminated silicon photovoltaic cell?

A. 0.02 VDC

B. 0.5 VDC

C. 0.2 VDC

D. 1.38 VDC

G4E09 (B)

What is the approximate open-circuit voltage from a fully illuminated silicon photovoltaic cell?

A. 0.02 VDC

B. 0.5 VDC

C. 0.2 VDC

D. 1.38 VDC

G4E10

Why should a series diode be connected between a solar panel and a storage battery that is being charged by the panel?

A. To prevent overload by regulating the charging voltage

B. To prevent discharge of the battery through the panel during times of low or no illumination

C. To limit the current flowing from the panel to a safe value

D. To prevent damage to the battery due to excessive voltage at high illumination levels

G4E10 (B)

Why should a series diode be connected between a solar panel and a storage battery that is being charged by the panel?

A. To prevent overload by regulating the charging voltage

B. To prevent discharge of the battery through the panel during times of low or no illumination

C. To limit the current flowing from the panel to a safe value

D. To prevent damage to the battery due to excessive voltage at high illumination levels

G4E11

What precaution should be taken when connecting a solar panel to a lithium iron phosphate battery?

A. Ground the solar panel outer metal framework

B. Ensure the battery is placed terminals-up

C. A series resistor must be in place

D. The solar panel must have a charge controller

G4E11 (D)

What precaution should be taken when connecting a solar panel to a lithium iron phosphate battery?

A. Ground the solar panel outer metal framework

B. Ensure the battery is placed terminals-up

C. A series resistor must be in place

D. The solar panel must have a charge controller

SUBELEMENT G5 – ELECTRICAL PRINCIPLES

[3 Exam Questions – 3 Groups]

G5A – Reactance; inductance; capacitance; impedance; impedance transformation; resonance

G5A01

What happens when inductive and capacitive reactance are equal in a series LC circuit?

A. Resonance causes impedance to be very high

B. Impedance is equal to the geometric mean of the inductance and capacitance

C. Resonance causes impedance to be very low

D. Impedance is equal to the arithmetic mean of the inductance and capacitance

G5A01 (C)

What happens when inductive and capacitive reactance are equal in a series LC circuit?

A. Resonance causes impedance to be very high

B. Impedance is equal to the geometric mean of the inductance and capacitance

C. Resonance causes impedance to be very low

D. Impedance is equal to the arithmetic mean of the inductance and capacitance

G5A02

What is reactance?

A. Opposition to the flow of direct current caused by resistance

B. Opposition to the flow of alternating current caused by capacitance or inductance

C. Reinforcement of the flow of direct current caused by resistance

D. Reinforcement of the flow of alternating current caused by capacitance or inductance

G5A02 (B)

What is reactance?

A. Opposition to the flow of direct current caused by resistance

B. Opposition to the flow of alternating current caused by capacitance or inductance

C. Reinforcement of the flow of direct current caused by resistance

D. Reinforcement of the flow of alternating current caused by capacitance or inductance

G5A03

Which of the following is opposition to the flow of alternating current in an inductor?

A. Conductance

B. Reluctance

C. Admittance

D. Reactance

G5A03 (D)

Which of the following is opposition to the flow of alternating current in an inductor?

A. Conductance

B. Reluctance

C. Admittance

D. Reactance

G5A04

Which of the following is opposition to the flow of alternating current in a capacitor?

A. Conductance

B. Reluctance

C. Reactance

D. Admittance

G5A04 (C)

Which of the following is opposition to the flow of alternating current in a capacitor?

A. Conductance

B. Reluctance

C. Reactance

D. Admittance

G5A05

How does an inductor react to AC?

A. As the frequency of the applied AC increases, the reactance decreases

B. As the amplitude of the applied AC increases, the reactance increases

C. As the amplitude of the applied AC increases, the reactance decreases

D. As the frequency of the applied AC increases, the reactance increases

G5A05 (D)

How does an inductor react to AC?

A. As the frequency of the applied AC increases, the reactance decreases

B. As the amplitude of the applied AC increases, the reactance increases

C. As the amplitude of the applied AC increases, the reactance decreases

D. As the frequency of the applied AC increases, the reactance increases

G5A06

How does a capacitor 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 increases

D. As the amplitude of the applied AC increases, the reactance decreases

G5A06 (A)

How does a capacitor 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 increases

D. As the amplitude of the applied AC increases, the reactance decreases

G5A07

What is the term for the inverse of impedance?

A. Conductance

B. Susceptance

C. Reluctance

D. Admittance

G5A07 (D)

What is the term for the inverse of impedance?

A. Conductance

B. Susceptance

C. Reluctance

D. Admittance

G5A08

What is impedance?

A. The ratio of current to voltage

B. The product of current and voltage

C. The ratio of voltage to current

D. The product of current and reactance

G5A08 (C)

What is impedance?

A. The ratio of current to voltage

B. The product of current and voltage

C. The ratio of voltage to current

D. The product of current and reactance

G5A09

What unit is used to measure reactance?

A. Farad

B. Ohm

C. Ampere

D. Siemens

G5A09 (B)

What unit is used to measure reactance?

A. Farad

B. Ohm

C. Ampere

D. Siemens

G5A10

Which of the following devices can be used for impedance matching at radio frequencies?

A. A transformer

B. A Pi-network

C. A length of transmission line

D. All these choices are correct

G5A10 (D)

Which of the following devices can be used for impedance matching at radio frequencies?

A. A transformer

B. A Pi-network

C. A length of transmission line

D. All these choices are correct

G5A11

What letter is used to represent reactance?

A. Z

B. X

C. B

D. Y

G5A11 (B)

What letter is used to represent reactance?

A. Z

B. X

C. B

D. Y

G5A12

What occurs in an LC circuit at resonance?

A. Current and voltage are equal

B. Resistance is cancelled

C. The circuit radiates all its energy in the form of radio waves

D. Inductive reactance and capacitive reactance cancel

G5A12 (D)

What occurs in an LC circuit at resonance?

A. Current and voltage are equal

B. Resistance is cancelled

C. The circuit radiates all its energy in the form of radio waves

D. Inductive reactance and capacitive reactance cancel

G5B – The decibel; current and voltage dividers; electrical power calculations; sine wave root-mean-square (RMS) values; PEP calculations

G5B01

What dB change represents a factor of two increase or decrease in power?

A. Approximately 2 dB

B. Approximately 3 dB

C. Approximately 6 dB

D. Approximately 9 dB

G5B01 (B)

What dB change represents a factor of two increase or decrease in power?

A. Approximately 2 dB

B. Approximately 3 dB

C. Approximately 6 dB

D. Approximately 9 dB

G5B02

How does the total current relate to the individual currents in a circuit of parallel resistors?

A. It equals the average of the branch currents

B. It decreases as more parallel branches are added to the circuit

C. It equals the sum of the currents through each branch

D. It is the sum of the reciprocal of each individual voltage drop

G5B02 (C)

How does the total current relate to the individual currents in a circuit of parallel resistors?

A. It equals the average of the branch currents

B. It decreases as more parallel branches are added to the circuit

C. It equals the sum of the currents through each branch

D. It is the sum of the reciprocal of each individual voltage drop

G5B03

How many watts of electrical power are consumed if 400 VDC is supplied to an 800-ohm load?

A. 0.5 watts

B. 200 watts

C. 400 watts

D. 3200 watts

G5B03 (B)

How many watts of electrical power are consumed if 400 VDC is supplied to an 800-ohm load?

A. 0.5 watts

B. 200 watts

C. 400 watts

D. 3200 watts

G5B04

How many watts of electrical power are consumed by a 12 VDC light bulb that draws 0.2 amperes?

A. 2.4 watts

B. 24 watts

C. 6 watts

D. 60 watts

G5B04 (A)

How many watts of electrical power are consumed by a 12 VDC light bulb that draws 0.2 amperes?

A. 2.4 watts

B. 24 watts

C. 6 watts

D. 60 watts

G5B05

How many watts are consumed when a current of 7.0 milliamperes flows through a 1,250-ohm resistance?

A. Approximately 61 milliwatts

B. Approximately 61 watts

C. Approximately 11 milliwatts

D. Approximately 11 watts

G5B05 (A)

How many watts are consumed when a current of 7.0 milliamperes flows through a 1,250-ohm resistance?

A. Approximately 61 milliwatts

B. Approximately 61 watts

C. Approximately 11 milliwatts

D. Approximately 11 watts

G5B06

What is the PEP produced by 200 volts peak-to-peak across a 50-ohm dummy load?

A. 1.4 watts

B. 100 watts

C. 353.5 watts

D. 400 watts

G5B06 (B)

What is the PEP produced by 200 volts peak-to-peak across a 50-ohm dummy load?

A. 1.4 watts

<u>B. 100 watts</u>

C. 353.5 watts

D. 400 watts

G5B07

What value of an AC signal produces the same power dissipation in a resistor as a DC voltage of the same value?

A. The peak-to-peak value

B. The peak value

C. The RMS value

D. The reciprocal of the RMS value

G5B07 (C)

What value of an AC signal produces the same power dissipation in a resistor as a DC voltage of the same value?

A. The peak-to-peak value

B. The peak value

C. The RMS value

D. The reciprocal of the RMS value

G5B08

What is the peak-to-peak voltage of a sine wave with an RMS voltage of 120 volts?

A. 84.8 volts

B. 169.7 volts

C. 240.0 volts

D. 339.4 volts

G5B08 (D)

What is the peak-to-peak voltage of a sine wave with an RMS voltage of 120 volts?

A. 84.8 volts

B. 169.7 volts

C. 240.0 volts

D. 339.4 volts

G5B09

What is the RMS voltage of a sine wave with a value of 17 volts peak?

A. 8.5 volts

B. 12 volts

C. 24 volts

D. 34 volts

G5B09 (B)

What is the RMS voltage of a sine wave with a value of 17 volts peak?

A. 8.5 volts

B. 12 volts

C. 24 volts

D. 34 volts

G5B10

What percentage of power loss is equivalent to a loss of 1 dB?

A. 10.9 percent

B. 12.2 percent

C. 20.6 percent

D. 25.9 percent

G5B10 (C)

What percentage of power loss is equivalent to a loss of 1 dB?

A. 10.9 percent

B. 12.2 percent

C. 20.6 percent

D. 25.9 percent

G5B11

What is the ratio of PEP to average power for an unmodulated carrier?

A. 0.707

B. 1.00

C. 1.414

D. 2.00

G5B11 (B)

What is the ratio of PEP to average power for an unmodulated carrier?

A. 0.707

B. 1.00

C. 1.414

D. 2.00

G5B12

What is the RMS voltage across a 50-ohm dummy load dissipating 1200 watts?

A. 173 volts

B. 245 volts

C. 346 volts

D. 692 volts

G5B12 (B)

What is the RMS voltage across a 50-ohm dummy load dissipating 1200 watts?

A. 173 volts

B. 245 volts

C. 346 volts

D. 692 volts

G5B13

What is the output PEP of an unmodulated carrier if the average power is 1060 watts?

A. 530 watts

B. 1060 watts

C. 1500 watts

D. 2120 watts

G5B13 (B)

What is the output PEP of an unmodulated carrier if the average power is 1060 watts?

A. 530 watts

B. 1060 watts

C. 1500 watts

D. 2120 watts

G5B14

What is the output PEP of 500 volts peak-to-peak across a 50-ohm load?

A. 8.75 watts

B. 625 watts

C. 2500 watts

D. 5000 watts

G5B14 (B)

What is the output PEP of 500 volts peak-to-peak across a 50-ohm load?

A. 8.75 watts

B. 625 watts

C. 2500 watts

D. 5000 watts

G5C – Resistors, capacitors, and inductors in series and parallel; transformers

G5C01

What causes a voltage to appear across the secondary winding of a transformer when an AC voltage source is connected across its primary winding?

A. Capacitive coupling

B. Displacement current coupling

C. Mutual inductance

D. Mutual capacitance

G5C01 (C)

What causes a voltage to appear across the secondary winding of a transformer when an AC voltage source is connected across its primary winding?

A. Capacitive coupling

B. Displacement current coupling

C. Mutual inductance

D. Mutual capacitance

G5C02

What is the output voltage if an input signal is applied to the secondary winding of a 4:1 voltage step-down transformer instead of the primary winding?

A. The input voltage is multiplied by 4

B. The input voltage is divided by 4

C. Additional resistance must be added in series with the primary to prevent overload

D. Additional resistance must be added in parallel with the secondary to prevent overload

G5C02 (A)

What is the output voltage if an input signal is applied to the secondary winding of a 4:1 voltage step-down transformer instead of the primary winding?

A. The input voltage is multiplied by 4

B. The input voltage is divided by 4

C. Additional resistance must be added in series with the primary to prevent overload

D. Additional resistance must be added in parallel with the secondary to prevent overload

G5C03

What is the total resistance of a 10-, a 20-, and a 50-ohm resistor connected in parallel?

A. 5.9 ohms

B. 0.17 ohms

C. 17 ohms

D. 80 ohms

G5C03 (A)

What is the total resistance of a 10-, a 20-, and a 50-ohm resistor connected in parallel?

A. 5.9 ohms

B. 0.17 ohms

C. 17 ohms

D. 80 ohms

G5C04

What is the approximate total resistance of a 100- and a 200-ohm resistor in parallel?

A. 300 ohms

B. 150 ohms

C. 75 ohms

D. 67 ohms

G5C04 (D)

What is the approximate total resistance of a 100- and a 200-ohm resistor in parallel?

A. 300 ohms

B. 150 ohms

C. 75 ohms

D. 67 ohms

G5C05

Why is the primary winding wire of a voltage step-up transformer usually a larger size than that of the secondary winding?

A. To improve the coupling between the primary and secondary

B. To accommodate the higher current of the primary

C. To prevent parasitic oscillations due to resistive losses in the primary

D. To ensure that the volume of the primary winding is equal to the volume of the secondary winding

G5C05 (B)

Why is the primary winding wire of a voltage step-up transformer usually a larger size than that of the secondary winding?

A. To improve the coupling between the primary and secondary

B. To accommodate the higher current of the primary

C. To prevent parasitic oscillations due to resistive losses in the primary

D. To ensure that the volume of the primary winding is equal to the volume of the secondary winding

G5C06

What is the voltage output of a transformer with a 500-turn primary and a 1500-turn secondary when 120 VAC is applied to the primary?

A. 360 volts

B. 120 volts

C. 40 volts

D. 25.5 volts

G5C06 (A)

What is the voltage output of a transformer with a 500-turn primary and a 1500-turn secondary when 120 VAC is applied to the primary?

A. 360 volts

B. 120 volts

C. 40 volts

D. 25.5 volts

G5C07

What transformer turns ratio matches an antenna’s 600-ohm feed point impedance to a 50-ohm coaxial cable?

A. 3.5 to 1

B. 12 to 1

C. 24 to 1

D. 144 to 1

G5C07 (A)

What transformer turns ratio matches an antenna’s 600-ohm feed point impedance to a 50-ohm coaxial cable?

A. 3.5 to 1

B. 12 to 1

C. 24 to 1

D. 144 to 1

G5C08

What is the equivalent capacitance of two 5.0-nanofarad capacitors and one 750-picofarad capacitor connected in parallel?

A. 576.9 nanofarads

B. 1,733 picofarads

C. 3,583 picofarads

D. 10.750 nanofarads

G5C08 (D)

What is the equivalent capacitance of two 5.0-nanofarad capacitors and one 750-picofarad capacitor connected in parallel?

A. 576.9 nanofarads

B. 1,733 picofarads

C. 3,583 picofarads

D. 10.750 nanofarads

G5C09

What is the capacitance of three 100-microfarad capacitors connected in series?

A. 0.33 microfarads

B. 3.0 microfarads

C. 33.3 microfarads

D. 300 microfarads

G5C09 (C)

What is the capacitance of three 100-microfarad capacitors connected in series?

A. 0.33 microfarads

B. 3.0 microfarads

C. 33.3 microfarads

D. 300 microfarads

G5C10

What is the inductance of three 10-millihenry inductors connected in parallel?

A. 0.30 henries

B. 3.3 henries

C. 3.3 millihenries

D. 30 millihenries

G5C10 (C)

What is the inductance of three 10-millihenry inductors connected in parallel?

A. 0.30 henries

B. 3.3 henries

C. 3.3 millihenries

D. 30 millihenries

G5C11

What is the inductance of a circuit with a 20-millihenry inductor connected in series with a 50-millihenry inductor?

A. 7 millihenries

B. 14.3 millihenries

C. 70 millihenries

D. 1,000 millihenries

G5C11 (C)

What is the inductance of a circuit with a 20-millihenry inductor connected in series with a 50-millihenry inductor?

A. 7 millihenries

B. 14.3 millihenries

C. 70 millihenries

D. 1,000 millihenries

G5C12

What is the capacitance of a 20-microfarad capacitor connected in series with a 50-microfarad capacitor?

A. 0.07 microfarads

B. 14.3 microfarads

C. 70 microfarads

D. 1,000 microfarads

G5C12 (B)

What is the capacitance of a 20-microfarad capacitor connected in series with a 50-microfarad capacitor?

A. 0.07 microfarads

B. 14.3 microfarads

C. 70 microfarads

D. 1,000 microfarads

G5C13

Which of the following components should be added to a capacitor to increase the capacitance?

A. An inductor in series

B. An inductor in parallel

C. A capacitor in parallel

D. A capacitor in series

G5C13 (C)

Which of the following components should be added to a capacitor to increase the capacitance?

A. An inductor in series

B. An inductor in parallel

C. A capacitor in parallel

D. A capacitor in series

G5C14

Which of the following components should be added to an inductor to increase the inductance?

A. A capacitor in series

B. A capacitor in parallel

C. An inductor in parallel

D. An inductor in series

G5C14 (D)

Which of the following components should be added to an inductor to increase the inductance?

A. A capacitor in series

B. A capacitor in parallel

C. An inductor in parallel

D. An inductor in series

SUBELEMENT G6 – CIRCUIT COMPONENTS

[2 Exam Questions – 2 Groups]

G6A – Resistors; capacitors; inductors; rectifiers; solid-state diodes and transistors; vacuum tubes; batteries