

# Subelement G0 - Electrical And Rf Safety

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## Group GOA - - RF safety principles, rules, and guidelines; routine station evaluation

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### GOA01 (A)

What is one way that RF energy can affect human body tissue?

- A. It heats body tissue
- B. It causes radiation poisoning
- C. It causes the blood count to reach a dangerously low level
- D. It cools body tissue

### GOA02 (D)

Which of the following is used to determine RF exposure from a transmitted signal?

- A. Its duty cycle
- B. Its frequency
- C. Its power density
- D. All these choices are correct

### GOA03 (D)

How can you determine that your station complies with FCC RF exposure regulations?

- A. By calculation based on FCC OET Bulletin 65
- B. By calculation based on computer modeling
- C. By measurement of field strength using calibrated equipment
- D. All these choices are correct

### GOA04 (D)

What does "time averaging" mean when evaluating RF radiation exposure?

- A. The average amount of power developed by the transmitter over a specific 24-hour period
- B. The average time it takes RF radiation to have any long-term effect on the body
- C. The total time of the exposure
- D. The total RF exposure averaged over a certain period

### GOA05 (A)

What must you do if an evaluation of your station shows that the RF energy radiated by your station exceeds permissible limits for possible human absorption?

- A. Take action to prevent human exposure to the excessive RF fields
- B. File an Environmental Impact Statement (EIS-97) with the FCC
- C. Secure written permission from your neighbors to operate above the controlled MPE limits
- D. All these choices are correct

### GOA06 (A)

What must you do if your station fails to meet the FCC RF exposure exemption criteria?

- A. Perform an RF Exposure Evaluation in accordance with FCC OET Bulletin 65
- B. Contact the FCC for permission to transmit
- C. Perform an RF exposure evaluation in accordance with World Meteorological Organization guidelines
- D. Use an FCC-approved band-pass filter

### GOA07 (A)

**What is the effect of modulation duty cycle on RF exposure?**

- A. A lower duty cycle permits greater power levels to be transmitted
- B. A higher duty cycle permits greater power levels to be transmitted
- C. Low duty cycle transmitters are exempt from RF exposure evaluation requirements
- D. High duty cycle transmitters are exempt from RF exposure requirements

### GOA08 (C)

**Which of the following steps must an amateur operator take to ensure compliance with RF safety regulations?**

- A. Post a copy of FCC Part 97.13 in the station
- B. Notify neighbors within a 100-foot radius of the antenna of the existence of the station and power levels
- C. Perform a routine RF exposure evaluation and prevent access to any identified high exposure areas
- D. All these choices are correct

### GOA09 (B)

**What type of instrument can be used to accurately measure an RF field strength?**

- A. A receiver with digital signal processing (DSP) noise reduction
- B. A calibrated field strength meter with a calibrated antenna
- C. An SWR meter with a peak-reading function
- D. An oscilloscope with a high-stability crystal marker generator

### GOA10 (C)

**What should be done if evaluation shows that a neighbor might experience more than the allowable limit of RF exposure from the main lobe of a directional antenna?**

- A. Change to a non-polarized antenna with higher gain
- B. Use an antenna with a higher front-to-back ratio
- C. Take precautions to ensure that the antenna cannot be pointed in their direction when they are present
- D. All these choices are correct

### GOA11 (C)

**What precaution should be taken if you install an indoor transmitting antenna?**

- A. Locate the antenna close to your operating position to minimize feed-line radiation
- B. Position the antenna along the edge of a wall to reduce parasitic radiation
- C. Make sure that MPE limits are not exceeded in occupied areas
- D. Make sure the antenna is properly shielded

### GOA12 (D)

**What stations are subject to the FCC rules on RF exposure?**

- A. All commercial stations; amateur radio stations are exempt
- B. Only stations with antennas lower than one wavelength above the ground
- C. Only stations transmitting more than 500 watts PEP
- D. All stations with a time-averaged transmission of more than one milliwatt

**GOB01 (A)**

**Which wire or wires in a four-conductor 240 VAC circuit should be attached to fuses or circuit breakers?**

- A. Only the hot wires
- B. Only the neutral wire
- C. Only the ground wire
- D. All wires

**GOB02 (C)**

**According to the National Electrical Code, what is the minimum wire size that may be used safely for wiring with a 20-ampere circuit breaker?**

- A. AWG number 20
- B. AWG number 16
- C. AWG number 12
- D. AWG number 8

**GOB03 (D)**

**Which size of fuse or circuit breaker would be appropriate to use with a circuit that uses AWG number 14 wiring?**

- A. 30 amperes
- B. 25 amperes
- C. 20 amperes
- D. 15 amperes

**GOB04 (B)**

**Where should the station's lightning protection ground system be located?**

- A. As close to the station equipment as possible
- B. Outside the building
- C. Next to the closest power pole
- D. Parallel to the water supply line

**GOB05 (B)**

**Which of the following conditions will cause a ground fault circuit interrupter (GFCI) to disconnect AC power?**

- A. Current flowing from one or more of the hot wires to the neutral wire
- B. Current flowing from one or more of the hot wires directly to ground
- C. Overvoltage on the hot wires
- D. All these choices are correct

**GOB06 (C)**

**Which of the following is covered by the National Electrical Code?**

- A. Acceptable bandwidth limits
- B. Acceptable modulation limits
- C. Electrical safety of the station
- D. RF exposure limits of the human body

**GOB07 (B)**

**Which of these choices should be observed when climbing a tower using a safety harness?**

- A. Always hold on to the tower with one hand
- B. Confirm that the harness is rated for the weight of the climber and that it is within its allowable service life
- C. Ensure that all heavy tools are securely fastened to the harness
- D. All these choices are correct

**GOB08 (B)**

**What should be done before climbing a tower that supports electrically powered devices?**

- A. Notify the electric company that a person will be working on the tower
- B. Make sure all circuits that supply power to the tower are locked out and tagged
- C. Unground the base of the tower
- D. All these choices are correct

**GOB09 (A)**

**Which of the following is true of an emergency generator installation?**

- A. The generator should be operated in a well-ventilated area
- B. The generator must be insulated from ground
- C. Fuel should be stored near the generator for rapid refueling in case of an emergency
- D. All these choices are correct

**GOB10 (A)**

**Which of the following is a danger from lead-tin solder?**

- A. Lead can contaminate food if hands are not washed carefully after handling the solder
- B. High voltages can cause lead-tin solder to disintegrate suddenly
- C. Tin in the solder can "cold flow," causing shorts in the circuit
- D. RF energy can convert the lead into a poisonous gas

**GOB11 (D)**

**Which of the following is required for lightning protection ground rods?**

- A. They must be bonded to all buried water and gas lines
- B. Bends in ground wires must be made as close as possible to a right angle
- C. Lightning grounds must be connected to all ungrounded wiring
- D. They must be bonded together with all other grounds

**GOB12 (C)**

**What is the purpose of a power supply interlock?**

- A. To prevent unauthorized changes to the circuit that would void the manufacturer's warranty
- B. To shut down the unit if it becomes too hot
- C. To ensure that dangerous voltages are removed if the cabinet is opened
- D. To shut off the power supply if too much voltage is produced

**GOB13 (A)**

**Where should lightning arrestors be located?**

- A. Where the feed lines enter the building
- B. On the antenna, opposite the feed point
- C. In series with each ground lead
- D. At the closest power pole ground electrode

# Subelement G1 - Commission's Rules

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## Group G1A - - General class control operator frequency privileges; primary and secondary allocations

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### G1A01 (C)

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 (B)

On which of the following bands is phone operation prohibited?

- A. 160 meters
- B. 30 meters
- C. 17 meters
- D. 12 meters

### G1A03 (B)

On which of the following bands is image transmission prohibited?

- A. 160 meters
- B. 30 meters
- C. 20 meters
- D. 12 meters

### G1A04 (D)

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 (A)

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 (C)

**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 (D)

**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 (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 (C)

**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 (D)

**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 (B)

**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

**Group G1B - - Antenna structure limitations; good engineering and good amateur practice; beacon operation; prohibited transmissions; retransmitting radio signals**

**G1B01 (C)**

**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 (A)**

**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 (A)**

**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 (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 (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 (D)

**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

### G1B07 (B)

**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 (B)

**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 (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 (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 (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

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

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**G1C01 (A)**

**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 (C)**

**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 (A)**

**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 (A)**

**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 (C)**

**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

**G1C06 (D)**

**What is the limit for transmitter power on the 1.8 MHz band?**

- A. 200 watts PEP output
- B. 1000 watts PEP output
- C. 1200 watts PEP output
- D. 1500 watts PEP output

### G1C07 (C)

**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 (C)

**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 (D)

**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

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**Group G1D - - Volunteer Examiners and Volunteer Examiner Coordinators; temporary identification; element credit; remote operation**

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### G1D01 (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 (C)

**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 (C)

**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 (A)

**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 (A)

**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 (A)

**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 (C)

**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 (B)

**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 (C)

**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 (B)

**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 (D)

**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 (C)

**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

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**Group G1E - - Control categories; repeater regulations; third-party rules; ITU regions; automatically controlled digital station**

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### G1E01 (A)

**Which of the following would disqualify a third party from participating in sending a message via an amateur station?**

- A. The third party's amateur license has been revoked and not reinstated
- B. The third party is not a US citizen
- C. The third party is speaking in a language other than English
- D. All these choices are correct

### G1E02 (D)

**When may a 10-meter repeater retransmit the 2-meter signal from a station that has a Technician class control operator?**

- A. Under no circumstances
- B. Only if the station on 10-meters is operating under a Special Temporary Authorization allowing such retransmission
- C. Only during an FCC-declared general state of communications emergency
- D. Only if the 10-meter repeater control operator holds at least a General class license

### G1E03 (A)

**What is required to conduct communications with a digital station operating under automatic control outside the automatic control band segments?**

- A. The station initiating the contact must be under local or remote control
- B. The interrogating transmission must be made by another automatically controlled station
- C. No third-party traffic may be transmitted
- D. The control operator of the interrogating station must hold an Amateur Extra class license

### G1E04 (D)

**Which of the following conditions require a licensed amateur radio operator to take specific steps to avoid harmful interference to other users or facilities?**

- A. When operating within one mile of an FCC Monitoring Station
- B. When using a band where the Amateur Service is secondary
- C. When a station is transmitting spread spectrum emissions
- D. All these choices are correct

### G1E05 (C)

**What are the restrictions on messages sent to a third party in a country with which there is a Third-Party Agreement?**

- A. They must relate to emergencies or disaster relief
- B. They must be for other licensed amateurs
- C. They must relate to amateur radio, or remarks of a personal character, or messages relating to emergencies or disaster relief
- D. The message must be limited to no longer than 1 minute in duration and the name of the third party must be recorded in the station log

### G1E06 (C)

**The frequency allocations of which ITU region apply to radio amateurs operating in North and South America?**

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

### G1E07 (D)

**In what part of the 2.4 GHz band may an amateur station communicate with non-licensed Wi-Fi stations?**

- A. Anywhere in the band
- B. Channels 1 through 4
- C. Channels 42 through 45
- D. No part

### G1E08 (B)

**What is the maximum PEP output allowed for spread spectrum transmissions?**

- A. 100 milliwatts
- B. 10 watts
- C. 100 watts
- D. 1500 watts

### G1E10 (A)

**Why should an amateur operator normally avoid transmitting on 14.100, 18.110, 21.150, 24.930 and 28.200 MHz?**

- A. A system of propagation beacon stations operates on those frequencies
- B. A system of automatic digital stations operates on those frequencies
- C. These frequencies are set aside for emergency operations
- D. These frequencies are set aside for bulletins from the FCC

### G1E11 (D)

**On what bands may automatically controlled stations transmitting RTTY or data emissions communicate with other automatically controlled digital stations?**

- A. On any band segment where digital operation is permitted
- B. Anywhere in the non-phone segments of the 10-meter or shorter wavelength bands
- C. Only in the non-phone Extra Class segments of the bands
- D. Anywhere in the 6-meter or shorter wavelength bands, and in limited segments of some of the HF bands

### G1E12 (A)

**When may third-party messages be transmitted via remote control?**

- A. Under any circumstances in which third party messages are permitted by FCC rules
- B. Under no circumstances except for emergencies
- C. Only when the message is intended for licensed radio amateurs
- D. Only when the message is intended for third parties in areas where licensing is controlled by the FCC