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General Class Unit 10
Question Pool §0

Electrical and RF Safety

2 Questions

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G0A02 G0A07 G0A02 G0A04

RF Exposure

RF energy can *heat body tissue*.

What affects your exposure to RF?

- *Frequency*
- *Power density*
- *Duty cycle*
  - *Lower transmitter duty cycle permits greater short-term exposure levels*

Time averaging refers to *the total RF exposure averaged over a certain time.*

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G0A08 G0A05

RF Exposure Thresholds

When transmitter power exceeds the levels listed in part 97.13, you must *perform a routine RF exposure evaluation*.

If your station exceeds permissible levels, you must *take action to prevent human exposure to the excessive RF fields*.

Part 97.13 Evaluation Thresholds			
Band	PEP (W)	Band	PEP (W)
160 m	500	10 m	50
80 m	500	VHF	50
75 m	500	70 cm	70
40 m	500	33 cm	150
30 m	425	23 cm	200
20 m	225	13 cm	250
17 m	125	SHF	250
15 m	100	EHF	250
12 m	75	Repeaters	Non-building mounted antennas with their lowest point < 10m and ERP > 500 watts, or building mounted with ERP > 300 watts

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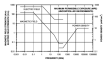
G0A03 G0A09

RF Exposure Evaluation

To determine that your station complies with FCC RF exposure regulations you can:



- *calculate based on FCC OET Bulletin 65.*
- *calculate based on computer modeling.*
- *measure the field strength using calibrated equipment.*

A calibrated field strength meter with a calibrated antenna can be used to accurately measure an RF field.

RF Exposure Precautions

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G0A10 G0A11 G0A06

If a neighbor might receive more than the allowable limit, *take precautions to ensure that the antenna cannot be pointed in their direction*.

In an indoor antenna installation *make sure that maximum permissible exposure (MPE) limits are not exceeded in occupied areas*.

A precaution that should be taken when installing a ground-mounted antenna is *it should be installed such that it is protected against unauthorized access*.

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Electrical Safety

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G0B06

The National Electrical Code covers the *electrical safety inside the ham shack.*

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Wire Size and Ratings

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G0B02 G0B03

Wires come in a multitude of sizes using the AWG numbering system.

Larger numbers refer to smaller diameter wires.

The larger the AWG number the less current the wire is able to carry.

The minimum size wire capable of carrying 20 amps continuous current is *AWG number 12*.

A *15 amperes* circuit breaker would be appropriate for a circuit wired with AWG number 14 wiring.

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AC Electrical Safety

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AC electrical wiring normally consists of 3 or more wires.

The “hot” lead, which is black, is the one that is controlled by switches and fuses.


Hot

The “neutral” lead is white, and acts as the common return path for every circuit.


Neutral

The “ground” lead is green, and drains off excess voltage in case of a fault or short.


Ground

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Electrical Safety

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G0B01 G0B05

In AC wiring the fuse or circuit breakers should be connected to the hot wire(s) only.

In a four-conductor line cord *only the two wires carrying voltage* should be attached to fuses or circuit breakers in a device operated from a 240-VAC single-phase source.

The condition that will cause a Ground Fault Circuit Interrupter (GFCI) to disconnect the 120 or 240 Volt AC line power to a device is the *current flowing from one or more of the voltage-carrying wires directly to ground*.

Tower Safety

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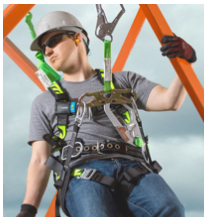
G0B08 G0B07 G0B11

When any person is preparing to climb a tower that supports electrically powered devices, *make sure all circuits that supply power to the tower are locked out and tagged*.



When climbing a tower using a safety belt or harness, *confirm that the belt is rated for the weight of the climber and that it is within its allowable service life*.

Lightning protection grounds *must be bonded together with all other grounds*.

Miscellaneous Safety

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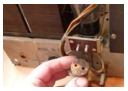
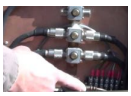
G0B10 G0B12 G0B14

A danger from lead-tin solder is *lead can contaminate food if hands are not washed carefully after handling*.

A power supply interlock *ensures that dangerous voltages are removed if the cabinet is opened*.



When making adjustments or repairs to an antenna, *turn off the transmitter and disconnect the feed line*.



Generator Safety

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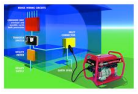
G0B04 G0B13 G0B09

Do not place a generator inside of an occupied area as there is a *danger of carbon monoxide poisoning*.

When powering your house from an emergency generator be sure to *disconnect the incoming utility power feed*.



The generator should be located in a well ventilated area.