

T1 Commissions Rules T1B Technician Frequency Privileges

VHF/UHF Bands

The F.C.C. authorizes a Technician with No Morse Code Licensee to operate on authorized frequency segments (or bands) above 30 MHz. This region is called VHF and UHF for Very High Frequency and Ultra High Frequency. Much of the activity here is local to your area. These bands are fun and you will meet many people here.

The Bands

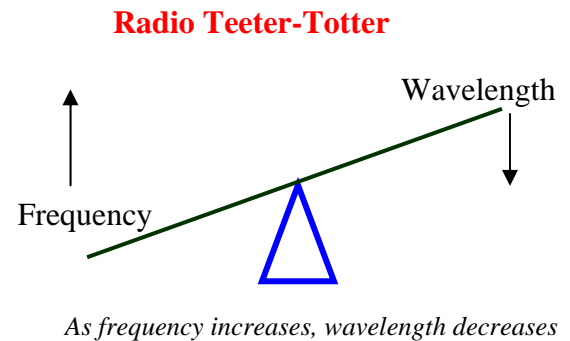
The VHF and UHF bands are labeled by wavelength not frequency. If you are talking about a segment of frequencies it would not be wise to say: "I bought a radio that works on the 50.0 to 54.0 MHz Band." It is much easier to tell your friend that your radio works on the 6M VHF band. The number "6" for Six Meters stands for the wavelength of the radio wave in the 50 MHz region.

The Technician VHF / UHF Amateur Bands

50.0MHz	54.0MHz	6 Meter Band VHF
144.0MHz	148.0MHz	2 Meter Band VHF
222.0MHz	225.0MHz	1.25 Meter Band VHF
420.0MHz	450.0MHz	70 centimeter Band UHF
902MHz	928MHz	33 centimeter Band UHF
1240MHz	1300MHz	23 centimeter Band UHF
2300~2310MHz	2390~2450MHz	13 centimeter Band UHF **

** Note: The 13cm band above is split into two segments.

One piece is from 2300 to 2310 Megahertz and the other segment is from 2390 to 2450 MegaHertz



The Technician HF Amateur Bands

3525kHz	3600kHz	80 Meter Band HF
7.025MHz	7.125MHz	40 Meter Band HF
21.025MHz	21.200MHz	15 Meter Band HF
28.000MHz	28.500MHz	10 Meter Band HF

Important Info:

All presentations & info : hamclass.org ---Do at least 2 practice exams / day

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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.

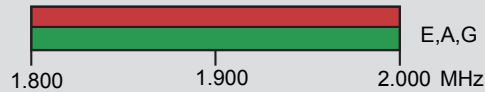
Effective Date
March 5, 2012

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225 Main Street, Newington, CT USA 06111-1494

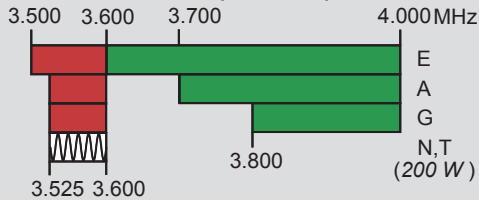


160 Meters (1.8 MHz)

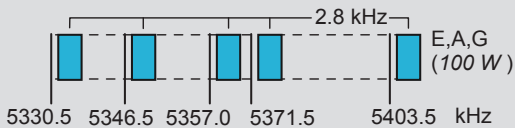
Avoid interference to radiolocation operations from 1.900 to 2.000 MHz



80 Meters (3.5 MHz)

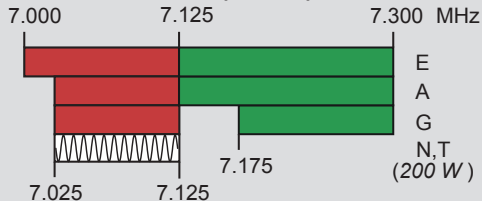


60 Meters (5.3 MHz)



General, Advanced, and Amateur Extra licensees may operate on these five channels on a secondary basis with a maximum effective radiated output of 100 W PEP. Permitted operating modes include upper sideband voice (USB), CW, RTTY, PSK31 and other digital modes such as PACTOR III as defined by the FCC Report and Order of November 18, 2011. USB is limited to 2.8 kHz centered on 5332, 5348, 5358.5, 5373 and 5405 kHz. CW and digital emissions must be centered 1.5 kHz above the channel frequencies indicated above. Only one signal at a time is permitted on any channel.

40 Meters (7 MHz)



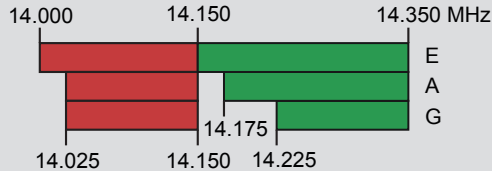
Phone and Image modes are permitted between 7.075 and 7.100 MHz for FCC licensed stations in ITU Regions 1 and 3 and by FCC licensed stations in ITU Region 2 West of 130 degrees West longitude or South of 20 degrees North latitude. See Sections 97.305(c) and 97.307(f)(11). Novice and Technician licensees outside ITU Region 2 may use CW only between 7.025 and 7.075 MHz and between 7.100 and 7.125 MHz. 7.200 to 7.300 MHz is not available outside ITU Region 2. See Section 97.301(e). These exemptions do not apply to stations in the continental US.

30 Meters (10.1 MHz)

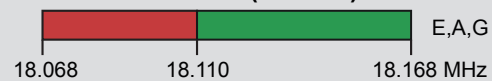
Avoid interference to fixed services outside the US.



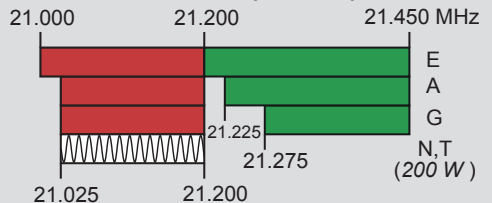
20 Meters (14 MHz)



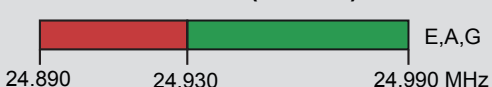
17 Meters (18 MHz)



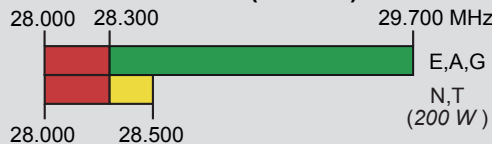
15 Meters (21 MHz)



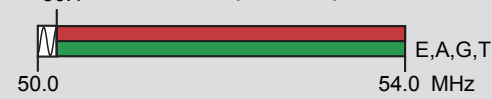
12 Meters (24 MHz)



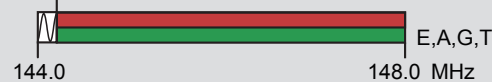
10 Meters (28 MHz)



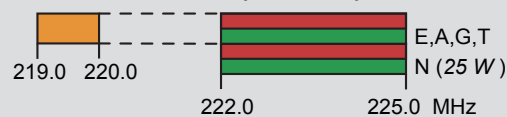
6 Meters (50 MHz)



2 Meters (144 MHz)

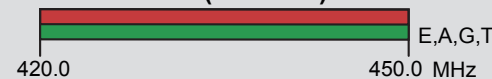


1.25 Meters (222 MHz)



*Geographical and power restrictions may apply to all bands above 420 MHz. See *The ARRL Operating Manual* for information about your area.

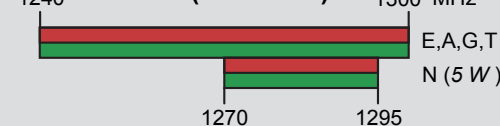
70 cm (420 MHz)*



33 cm (902 MHz)*



23 cm (1240 MHz)*



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.

ARRL
We're At Your Service

ARRL Headquarters:
860-594-0200 (Fax 860-594-0259)
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Toll-Free 1-888-277-5289 (860-594-0338)
email: membership@arrl.org

Getting Started in Amateur Radio:
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email: newham@arrl.org

Exams: 860-594-0300 email: vec@arrl.org

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Power Law

In electric circuits, power is a function of both voltage and current.

$$P=IE$$

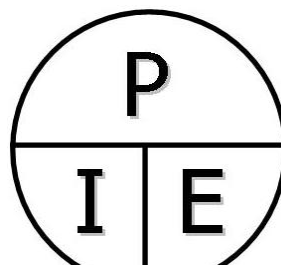
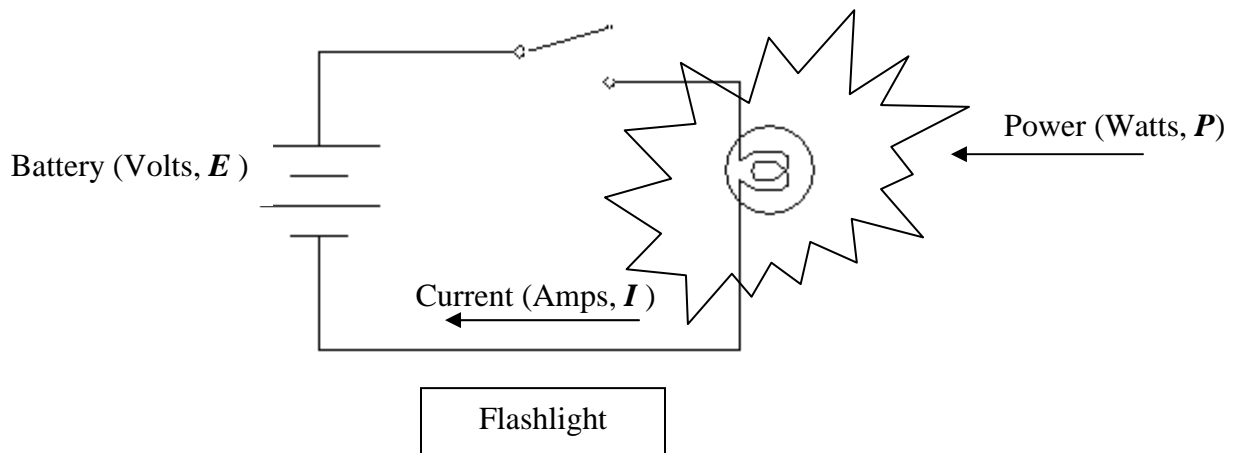
In this case, power (P) is exactly equal to current (I) multiplied by voltage (E), When using this formula, the unit of measurement for power is the *watt*, abbreviated with the letter "W."

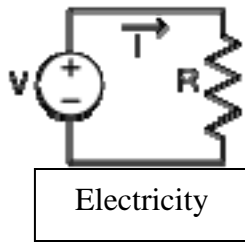
It must be understood that neither voltage nor current by themselves constitute power. Rather, power is the combination of both voltage *and* current in a circuit.

A circuit with high voltage and low current may be providing the same amount of *power* as a circuit with low voltage and high current. Neither the amount of voltage alone nor the amount of current alone indicates the amount of *power* in an electric circuit.

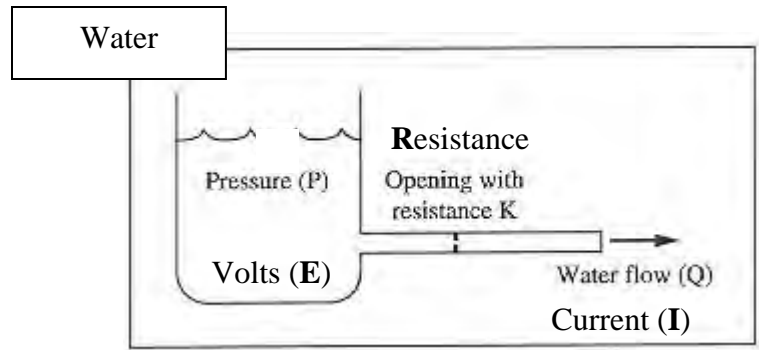
In an open circuit, where voltage is present between the terminals of the source and there is zero current, there is *zero* power dissipated, no matter how great that voltage may be. Since $P=IE$ and $I=0$ and anything multiplied by zero is zero, the power dissipated in any open circuit must be zero. Likewise, if we were to have a short circuit constructed of a loop of superconducting wire (absolutely zero resistance), we could have a condition of current in the loop with zero voltage, and likewise no power would be dissipated. Since $P=IE$ and $E=0$ and anything multiplied by zero is zero.

- **REVIEW:**
- Power is the measure of how much work can be done in a given amount of time.
- Electrical power is almost always measured in "watts," and it can be calculated by the formula $P = IE$.
- Electrical power is a product of both voltage *and* current, not either one separately.





Ohm's Law



E (Voltage, Volts): The Reservoir creates a pressure on the water to flow through the pipe and down the hose. This system pressure can be adjusted in many ways by placing the pipe in a faster water flow, adding an electric pump to boost it, or changing the pipe-to-upstream angle. This pressure is the driving force and without it everything stops working.

The pressure is analogous to the voltage driving an electrical circuit. We can change the voltage, or electrical "pressure" in an electrical system-for example, by changing the battery or generator size.

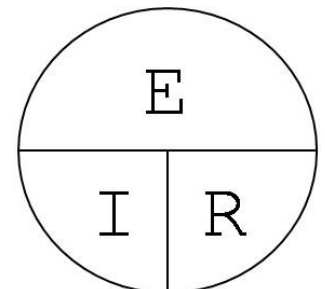
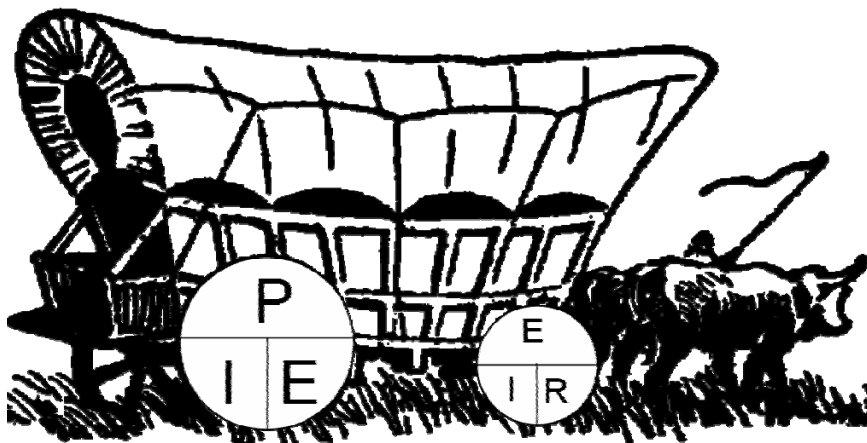
R (Resistance, Ohms): The pipe and hoses form a conduit for the water to flow through. If the conduit has kinks, blockages and very narrow areas, the water flowing will encounter difficulty which will reduce its rate of flow. If the conduit is wide, smooth and straight, the water will flow at maximum speed through the course.

If we seal off the end of the first hose attached to the "buried pipe-pump," even though the pressure is still present, the water flow will stop. If we decrease that blockage by drilling holes in the end-seal, the water will begin to flow. Thus, we can affect the water flow rate by changing the amount of restriction (resistance) at the hose end. Similarly, we can change the flow rate by switching to larger or narrower hoses, adding or removing blockages and kinks, etc.

I (Current, Amps): The amount of water flowing through the hose (say gallons per minute) is analogous to the electrical current (in electrons/second) flowing along a conductor.

We can't directly change the water flow rate. The water flow-rate is a predictable consequence of the pressure applied and the resistance encountered. We CAN, however, directly change the pressure (voltage) and the path restriction (resistance).

These three fundamental elements are the basis of Ohm's Law.





HamClass.org

Radio Recommendations



GOOD

BETTER

BEST

First radio:
Mobile



FT-2900 \$165
(mono band)



UV920R \$289
(Dual band)



FT-8900 \$425
(QUAD band)

2nd radio:
Handheld



UV-5R \$50
(Dual Band)



VX-7r \$349
(Quad Band)



VX-8Gr \$379 (APRS)

3rd radio:
HF
(use with your
General License)



FT-897 \$839



IC-7000 \$1439



Flex 5000 \$2799



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