Technician License Course
Chapter 7
Lesson Module 16:
Licensing Regulations:
Bands and Privileges

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Bands and Privileges

Amateur stations have bands or allocations of frequencies in most parts of the spectrum. Spectrum planning allows for best use of each band.

- Bands can be designated by frequency or wavelength.
- Remember:
  - Wavelength (Meters) = 300 / Frequency (MHz)
  - Frequency (MHz) = 300 / Wavelength (Meters)
- Your privileges on a band or subband depend on the class of your license.

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Emission Privileges

Types of Emission are CW, Phone, Data, and Image.

- CW is allowed on practically all frequencies but has exclusive sub-bands at the lower-frequency end of most bands. There are sub-bands for Phone, Data, and Image.
- CW and Data are usually in the same sub-bands.
- On HF, 6 M, 2 M, Phone is restricted to sub-bands.
- On bands above 50MHz, Technician class can use all emissions.
- Technician class has limited CW and Phone privileges on some HF bands below 30MHz.

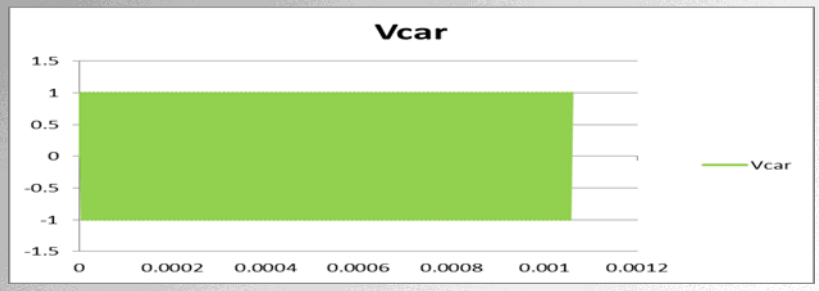
Power Limits

Power limits are specified in Peak Envelope Power (PEP) at the output of the transmitter. PEP is the power during the voltage peak.

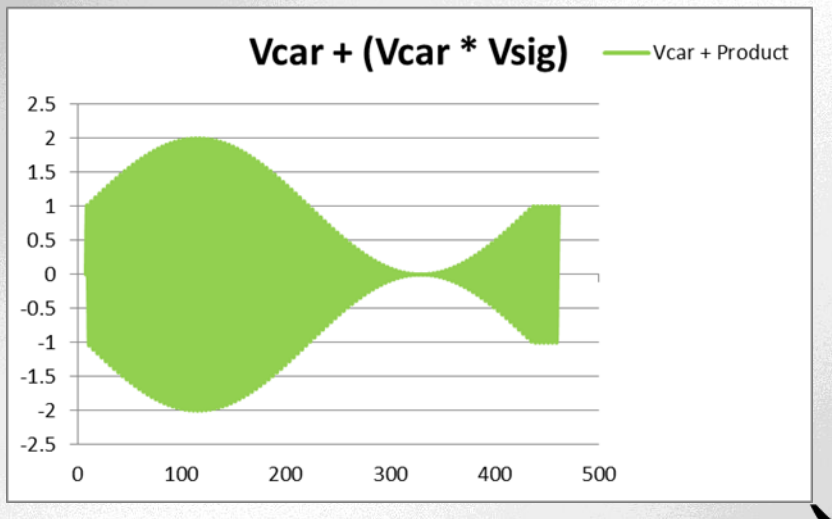
- Power is the square of the RMS voltage divided by the load resistance.
- PEP may be different than Average Power for some emission types.
- The maximum PEP for an amateur station is 1500 Watts.
- There are some bands where the maximum PEP is less than 1500 Watts.

What Is Peak Envelope Power?

Unmodulated RF



AM with Carrier



Measure Peak Voltage.

$V_{Peak} = V_{Peak\text{-}Peak} / 2$

Calculate RMS Voltage.

$V_{RMS} = 0.707 * V_{Peak}$

$PEP = (V_{RMS})^2 / R$

PEP for unmodulated or FM is constant.

PEP for AM is defined at peak of modulation.

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Some Power Restrictions

There are some bands and situations where 1500 Watts PEP is not allowed.

- Novice / Technician sub-bands on 80, 40, 15 and 10 Meters – 200 Watts if control operator is Novice or Technician
- All amateurs on 30 Meters – 200 Watts
- All amateurs on 219-220 MHz – 50 Watts
- Stations on 70cM may be limited to lower power near military installations or international borders.
- Stations on 60 Meters – 100 Watts **Effective Radiated Power** – Antenna gain over dipole has to be included.

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Technician Class Amateur VHF and UHF Bands

Table 5-2
VHF and UHF Technician Amateur Bands
ITU Region 2

Band (Wavelength)	*Frequency Limits*
VHF Range	
6 meters	50 - 54 MHz
2 meters	144 - 148 MHz
1.25 meters	219 - 220 MHz
1.25 meters	222 - 225 MHz
UHF Range	
70 centimeters	420 - 450 MHz
33 centimeters	902 - 928 MHz
23 centimeters	1240 - 1300 MHz
13 centimeters	2300 - 2310 MHz
13 centimeters	2390 - 2450 MHz

$$Band = \frac{300}{Freq(MHz)}$$

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Technician Class Emission Types

All the emission types below are allowed for Technician Class Licensees, but not on all bands.

Table 5-4
Amateur Emission Types

Emission	*Description*
CW	Morse code telegraphy
Data	Computer-to-computer communication modes, usually called *digital modes*
Image	Television (fast-scan and slow-scan) and facsimile or fax
MCW	Tone-modulated CW, Morse code generated by keying an audio tone
Phone	Speech or voice communications
Pulse	Communications using a sequence of pulses whose characteristics are modulated in order to carry information.
RTTY	Narrow-band, direct-printing telegraphy received by automatic equipment, such as a computer or teleprinter.
SS	Spread-spectrum communications in which the signal is spread out over a wide band of frequencies
Test	Transmissions containing no information

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Primary and Secondary Allocations

Some bands are shared with other radio services. For example, shortwave broadcasting has allocations within several HF amateur bands.

- Primary Service is given a higher priority and is protected from interference by Secondary services.
- Secondary Service has a lower priority and must accept interference from a Primary service.
- Sharing can be geographically determined.
- United States amateur stations are considered to be secondary in cases of interference to services outside the United States.

Repeaters and Coordination

Who decides what repeater can use a pair of frequencies?

- FCC rules allow amateur groups to coordinate the repeater allocations.
- Coordinating bodies are formed to govern allocations in a region.
- A repeater owner requests to use a pair of frequencies under coordination.
- FCC states that a repeater which is not coordinated is responsible to mitigate its interference to a repeater which is coordinated.
- The system requires cooperation between groups.

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