



Technician License Course

Chapter 7

Lesson Module 16: Licensing Regulations: Bands and Privileges



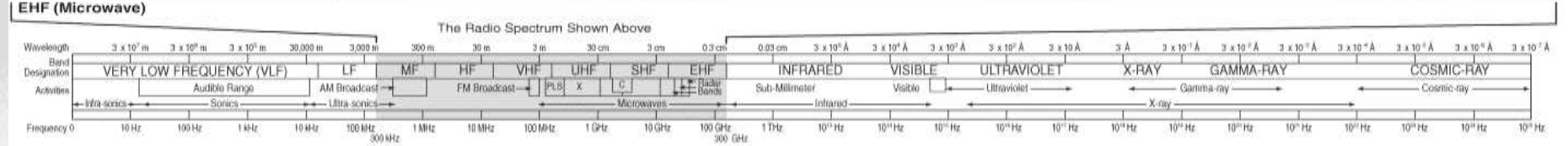
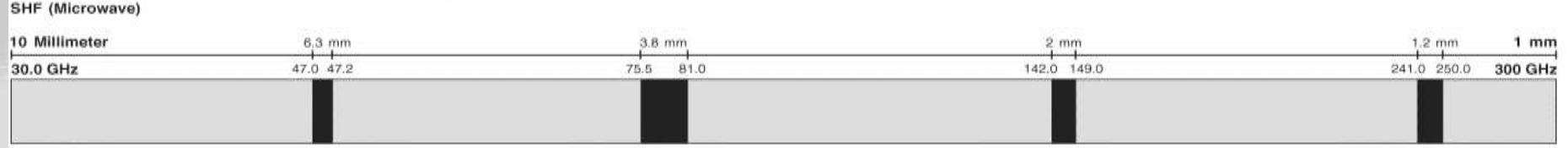
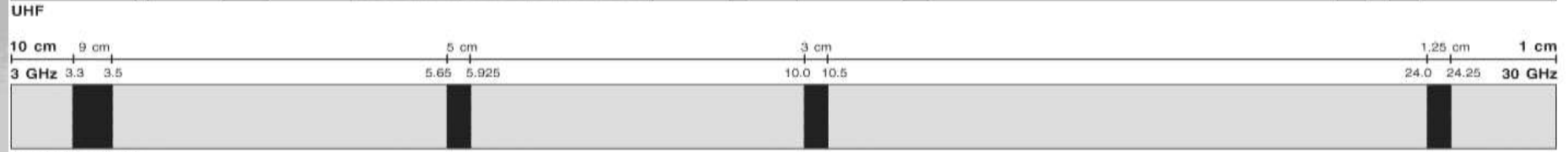
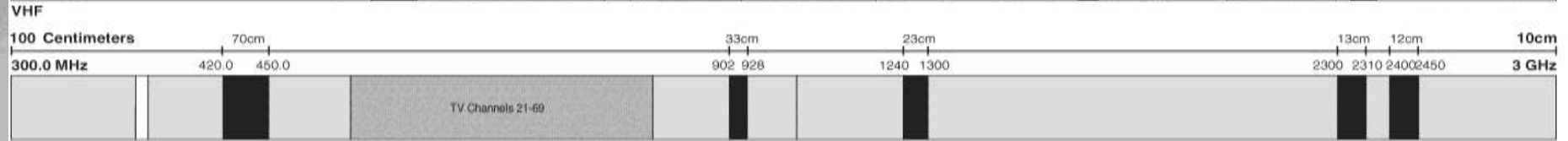
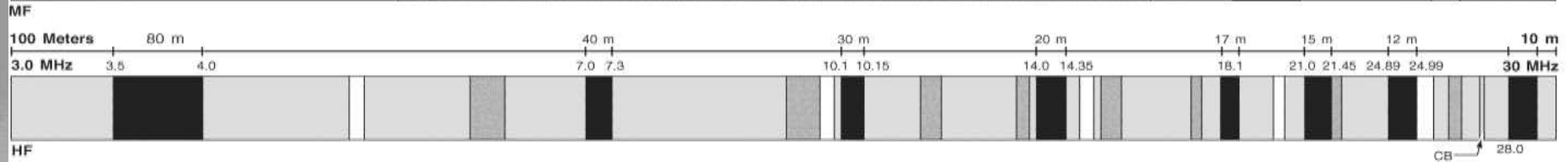
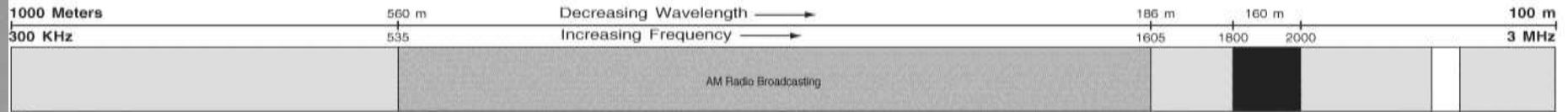
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Bands and Privileges

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) = $300 / \text{Frequency (MHz)}$
 - Frequency (MHz) = $300 / \text{Wavelength (Meters)}$
- Privilege to use a band or subband depends on the class of your license.





Amateur Radio Band
 WWV Frequency and Time Standard
 Shortwave and Commercial Broadcasting
 Various Services; Maritime and Aeronautical Navigation, CB, Police, Fire, Weather, Cordless phones, Cellular phones, Earth, Space and Weather research, and Satellite services.

Emission Privileges

Emission is the type of radio signal such as Phone, CW, Data, or Image. Emissions usually have sub-bands where they are allowed.

- CW is allowed on almost all frequencies but has exclusive sub-bands at the lower-frequency end of most bands.
- CW and Data can share some sub-bands.
- Phone is restricted to sub-bands on HF, 6 M, 2 M.
- Technician class can use all emissions on bands above 50MHz.
- Technician class has some sub-bands and privileges on some HF bands below 30MHz.



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Power Limits

Power limits are specified in Peak Envelope Power at the output of the transmitter. This 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.
- PEP may be read from a power meter or calculated from peak voltage.
- The maximum PEP for an amateur station is 1500 Watts.
- On some bands, the maximum PEP may be less than 1500 Watts.



Some Power Restrictions

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

- Novice / Technician sub-bands on 80, 40, and 15 Meters – 200 Watts for all amateurs
- Novices and Technicians on 10 Meters – 200 Watts
- All amateurs on 30 Meters – 200 Watts
- All amateurs on 219-220 MHz – 50 Watts
- Stations on 70cM may be limited to low power near military installations
- Stations on 60 Meters – 50 Watts Effective Radiated Power – Antenna gain has to be included.



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

<i>Emission</i>	<i>Description</i>
CW	Morse code telegraphy
Data	Computer-to-computer communication modes, usually called <i>digital modes</i>
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 instance, 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.
- Amateur stations are considered to be secondary in cases of interference to services outside the United States.



Band Plans

Band plans help to manage the allocated spectrum. The idea is to segregate emissions and operating modes which are not compatible.

- Band plans are developed by amateurs over time.
- FCC may consider adherence to band plans to be part of “good practice”.
- ARRL maintains a current band plan which is published online.



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 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.

