Ham Radio License Course

Discovering the Excitement of Ham Radio

ARRL The national association for AMATEUR RADIO®

SCARS Tech License Course – Week 1

Introduction to Amateur Radio

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Introductions

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Introductions

- State your name and a little about yourself.
- Why are you taking this course?
- What do you know about ham radio?
- What expectations do you have for yourself and your instructors?
- What do you know about ham radio?

Expectations

- Class will start and end on time.
- Instructor will be prepared for each topic.
- Students are expected to read assigned material before class and be ready to learn.
- Ham radio is NOT a spectator sport. Active participation in class is vital to success in obtaining your Technician Class license.

Course Overview

- Welcome to Amateur Radio
- Radio and Signal Fundamentals
- Electricity, Components and Circuits
- Propagation, Antennas and Feed Lines
- Amateur Radio Equipment
- Communicating with other Hams
- Licensing Regulations
- Operating Regulations
- Safety

Lets Get Started

- Our goal during this class is for each of you to achieve the Technician class Amateur Radio license! The license will authorize you to operate an Amateur Radio (ham radio) transmitter.

What is Amateur Radio?

Amateur (or Ham) Radio is a personal radio service authorized by the Federal Communications Commission (FCC)

- To encourage the advancement of the art and science of radio.
- To promote the development of an emergency communication capability to assist communities when needed.
- To develop a pool of trained radio operators.
- To promote international goodwill by connecting private citizens in countries around the globe.

Through ham radio, you will become an ambassador for your community and your country.

What is Amateur Radio?

Amateur (or Ham) Radio is a personal radio service authorized by the Federal Communications Commission (FCC)

- The Amateur Radio Service is governed by Part 97 of the FCC Rules and Regulations.
- Anyone can be a ham radio operator, there is no age limit.
- Amateur Radio operators cannot accept payment of ant type for operating their radio, whether money or other goods or services.

What Do Hams Do?

- Communicate
- Experiment
- Build
- Compete
- Serve their communities
- Engage in lifelong learning

What Makes Ham Radio Different?

- There are many unlicensed radio services available (FRS, GMRS, etc.)
- Amateur Radio is very flexible…
  - Fewer restrictions
  - More frequencies (channels or bands)
  - More power (to improve range and quality)
  - More ways to communicate
  - It's FREE to operate your radio!

With More Privileges Comes More Responsibility

- Ham Radios are much more capable and have the potential of interfering with other radio services.
- Ham radios have unlimited reach, they easily reach around the globe and into space.
- FCC authorization is required to ensure the operator is qualified to operate safely, legally and appropriately – this is why you are here.

Steps To Obtaining Your License

- Study the material in the Ham Radio License manual (Make sure you have the current edition).
- Review the question pool (back of the book).
- Take practice exams: www.arrl.org/examreview
  www.qrz.com
- Practice a proctored 35 question multiple choice test.

- Questions pulled directly from the question pool.
- Need to answer 26 questions correctly.

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Technician License Course

Chapter 7

Lesson Plan Module – 7a

License Regulations and Privileges

Section 1 – License Rules

- Licensing authority for Amateur Radio
  - Federal Communications Commission
  - FCC rules published in Part 97 of Title 47 – Code of Federal Regulations.
  - Usually referred to as “Part 97”

Why Is There Ham Radio? (Part 97.1)

- Providing emergency communication capability.
- Advancement of the art and science of radio.
- Advance communication and technical skills of radio.
- Provide a trained reservoir of operators, technicians and electronics experts.
- Promote and enhance international goodwill.

Some Definitions

- Amateur Service – no pecuniary interest (private and personal, non commercial).
- Amateur Operator – the person holding authorization (license) to operate an Amateur Radio station.
- Amateur Station – equipment capable of transmitting on frequencies authorized for Amateur Service.

The Amateur License

- No age limit or citizenship restrictions.
  - One exception – foreign representatives
- License actually contains two parts.
  - Operator license
  - Station license (the call sign)
- Three levels of operator privileges: Technician, General, Amateur Extra.

Licensing Examinations

- Volunteer Examiners (VEs)
- Volunteer Examiner Coordinators (VECs)
- Preparation
  - Study the content
  - Question Pool

Licensing Examinations

- Taking the exam
  - Proctored exam
  - Multiple choice
  - What the fee pays for

License Term and Renewal

- The license is free and good for 10 years.
  - Renewable within 90 days of the expiration date.
- Some personal identification information is required.
  - Tax ID (Social Security Number).
  - Current Mailing Address.
  - Federal Registration Number (FRN).

Responsibilities of Licensure

- Prevent unauthorized operation of your station.
- Provide personal information as required
  - Keep a current mailing address on file.
- Make your station available for FCC inspection upon request.

FCC ULS Web Site

www.wireless.fcc.gov/uls

- Register for on-line access to your license information.
- Make changes to your address and other information.
- Renew your license.
- Search for other station information

Section 2 – Privileges

- What can you do with a Technician license?
- Power privileges
  - Maximum of 1500 watts peak envelope power (PEP)
  - Don’t use excessive power for the purpose

Section 2 – Privileges

- Some special cases where power is restricted
- 200 watts on 80, 40, 15, 10 meters
- 50 watts on 219–220 MHz
- See §97.313 for other restrictions

Technician HF Privileges
200 watts PEP maximum output

Band (Wavelength)	*Frequency (MHz)*
80 meters	3.525-3.600 (CW only)
40 meters	7.025-7.125 (CW only)
15 meters	21.025-21.200 (CW only)
10 meters	28.000-28.300 (CW, RTTY and data)
	28.300-28.500 (CW and SSB)

What Can You Do with a Technician Class License?

- Frequency Privileges:
- Band versus frequency.

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

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

What Can You Do with a Technician Class License?

- Emission Privileges:

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

Primary and Secondary Allocations

- Some authorized amateur frequencies are shared.
  - Primary Users
  - Secondary Users – must avoid interfering with users of the primary service

Band Plans

- Voluntary arrangements that apply under normal band loading conditions

10 Meters (28-29.7 MHz)

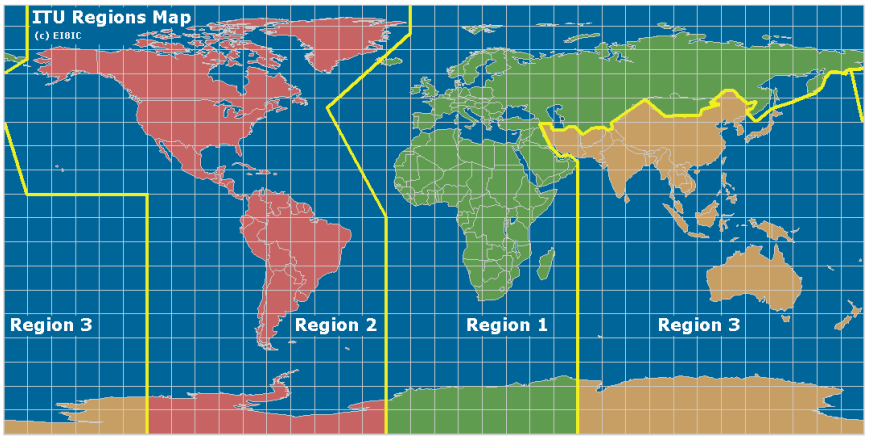
28.000-28.070	CW
28.070-28.150	RTTY
28.150-28.190	CW
28.200-28.300	Beacons
28.300-29.300	Phone
28.680	SSTV
29.000-29.200	AM
29.300-29.510	Satellite Downlinks
29.520-29.590	Repeater Inputs
29.600	FM Simplex
29.610-29.700	Repeater Outputs

Frequency Coordinators

- Elected by local or regional amateurs
- Repeaters approved by the coordinators are *coordinated*
- FCC considers frequency coordination "good amateur practice."
- Groups that help allocate repeater channels to minimize interference

Section 3 – International Rules

- International Telecommunication Union (ITU).
  - Regions 1, 2 and 3
  - Continental US hams are in Region 2
  - Some Pacific possessions in Region 3



International Operating Authorization

- Reciprocal operating authority
- International Amateur Radio Permit (IARP)
- CEPT licensing
- ARRL website on international operating
  - www.arrl.org/international-operating

International Operating Authorization

- Must comply with host country regulations
- May operate from US-flagged vessels
  - Host country's rules apply in territorial waters
- Contacts with other countries must be allowed by that country and by the US
  - Very rare for contacts to be prohibited!

Technician License Course

Chapter 7

Lesson Plan Module – 7b

Call Signs

Call Signs – Your "Radio Name"

- All amateur call signs have a prefix and a suffix

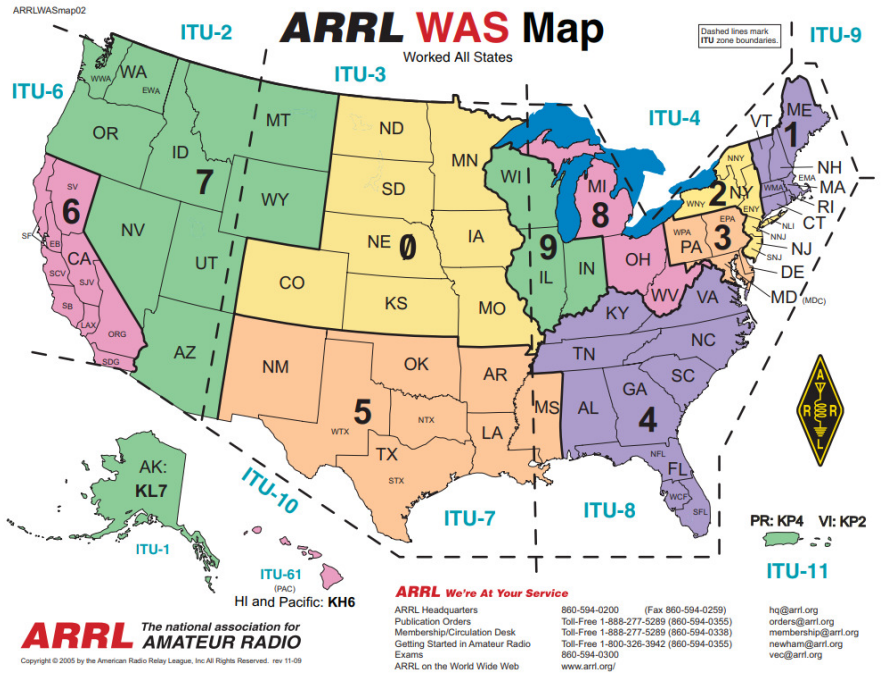
- Prefix – indicates country of license

- Suffix – indicates a specific licensee

- Prefix – generally two or three letters and numbers assigned by the ITU
- Suffix – one or more letters

Call Signs

- US call signs begin with: K, N, W, and AA–AL
- Ten US call sign districts indicated by 0–9 in prefix
- Pacific and Caribbean possessions have special prefixes



Call Signs

- U.S. call sign types for amateurs

- 1x1 (W1W); 1x2 (W1WW); 2x1 (WW1W); 2x2 (WW1WW); 1x3 (W1WWW); or 2x3 (WW1WWW)

- 1x1 (“one by one”) is for special events
- Remaining types are Group A through D

- Assigned by license class

Call Signs

- Indicators – added to the call sign following a slash (/) or a word such as “portable”
- Portable – operating away from primary station location
- Mobile, aeronautical mobile, maritime mobile
- Upgrade indicators “AG” or “AE” or “KT”

Choosing Your Call Sign

- Vanity call signs – similar to vanity license plates
- Pick any call sign authorized for your license class

- Technicians can have 2x3 (Group D) or 1x3 (Group C) calls

- www.arrl.org/vanity-call-signs

Choosing Your Call Sign

- Special event call signs: 1x1
- Reserved via administrators
  www.arrl.org/special-event-call-signs
- Club calls

- Must have a valid club
- Application by club's trustee
- www.arrl.org/club-call-signs

End of Week 1

https://w5nor.org/tech