3. RULES AND REGULATIONS – AJ6JG

Chapter 3 Part 1 of 1

ARRL General Class
Sections 3.1, 3.2, 3.3, 3.4

Regulatory Agencies

ITU: International Telecommunication Union

- Responsible for all international radio regulations
  - Each country decides how to administer & implement regulations
  - Countries may impose additional regulations (as long as they don’t conflict with ITU rules)
- 3 administrative regions (next slide)
- Individual regions have their greatest effect on amateurs in frequency allocations, and individual country allocations can also vary

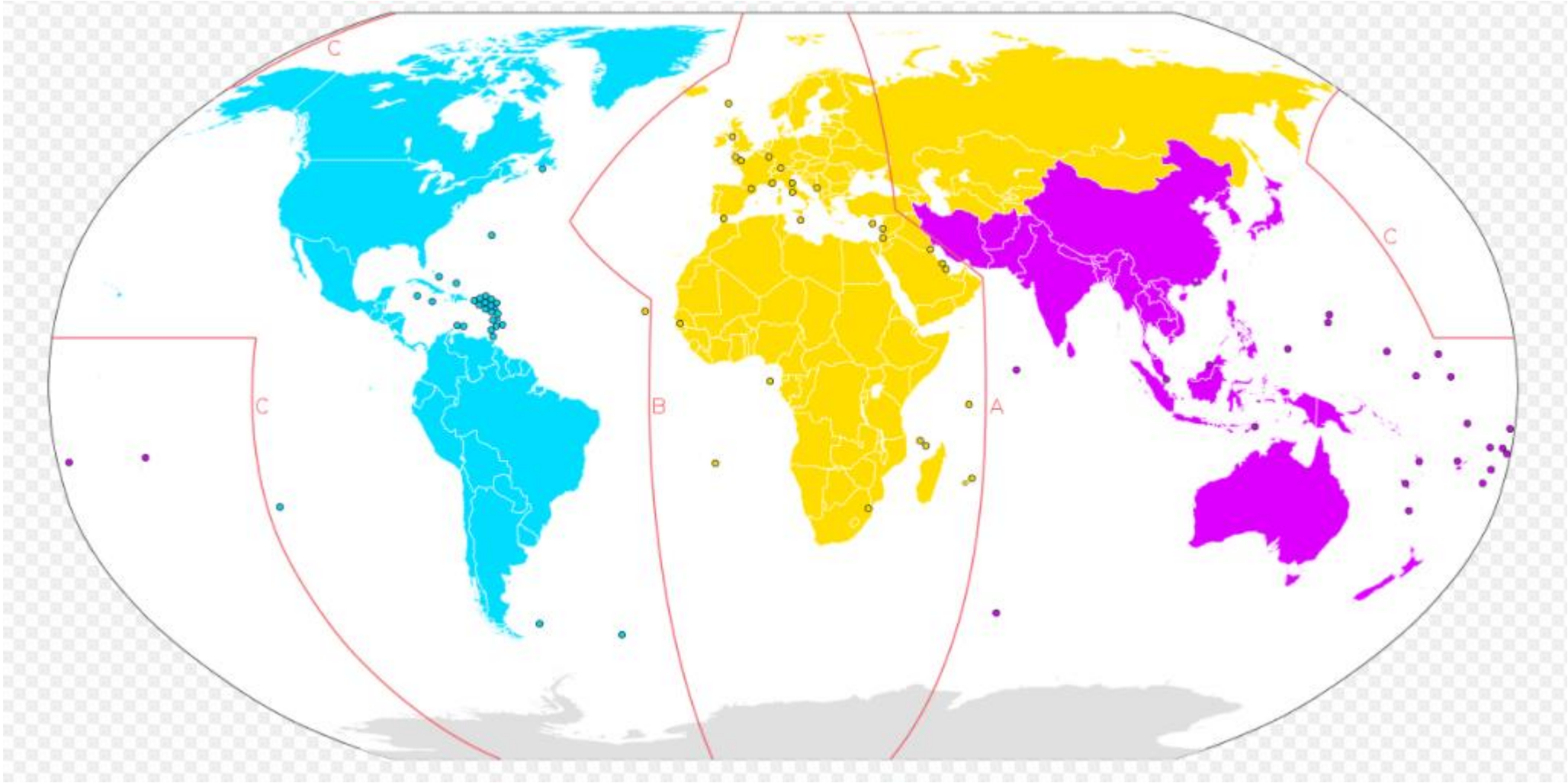
ITU Regions

REGION 1

REGION 2

REGION 3

North & South America, Alaska, Hawaii, and most US territories are in Region 2.



Regulatory Agencies (cont.)

FCC: Federal Communication Commission

- Governed by Electronic Code of Federal Regulations Part 97
  - www.arrl.org/part-97-amateur-radio
- Charged with writing and administering rules for US amateurs
- FCC jurisdiction includes all US states, possessions, territories, and US-flagged vessels in international waters
  - This includes some US territories in Region 3 (American Samoa, Guam, etc.). These have the same rules as amateurs in Region 2.

FCC Volunteer Monitoring Program

Amateur Radio Service is self-policing

ARRL created the Amateur Auxiliary in 1982 so amateurs could assist FCC with enforcement (Official Observers) and interference issues (Local Interference Committees)

Official Observer Program changed to Volunteer Monitoring Program (VMP) in 2018 … Goals: self-regulation & compliance

VMP made up of volunteer amateurs, monitoring airwaves for rules violations

VMP (cont.)

Training activities for monitoring include …

- Foxhunting
- Radio direction-finding (RDF)
- Used for quickly locating hidden transmitters
- Volunteer monitors might use these skills to locate stations violating FCC rules, intentionally or not

More information …

- www.homingin.com

Regulatory Agencies (cont.)

FAA: Federal Aviation Administration

- FAA has jurisdiction over antenna structures more than 200 ft. high and within 4 miles of a public use airport or heliport
- Must register such structures with FCC (to avoid aircraft hazards)

Local Building Authorities

- Local building codes may apply to towers & antennas
  - FCC Rule PRB-1: Amateur Service communications must be reasonably accommodated … regulations must be the minimum practical and have legitimate purpose

Amateur Licensing Rules

Volunteer Examiner Rules

- Volunteer licensing program is administered by Volunteer Examiner Coordinators (VECs)
- VECs have agreements with FCC to coordinate examinations
- VE accreditation requirements
  - Be accredited by a VEC
  - Be at least 18 years of age
  - Hold a General class or higher license
  - Have never had your license suspended or revoked
  - Pass a multiple-choice, open-book exam

- *No cost!*
- *Allows you to administer exams*

Examination Rules

Rules listed in FCC §97.509

Exams sessions coordinated by a VEC

Exams administered by three (3) accredited VEs

- VEs must hold necessary license class
  - General class may administer Technician (Element 2) exams
  - Advanced class … General (Elem 3) and Technician (Elem 2)
  - Amateur Extra class … Amateur Extra (Elem 4), General (Elem 3), Tech (Elem 2)

Exam Rules (cont.)

Those passing receive a Certificate of Successful Completion

CSCE good for 365 days … use the CSCE until your new license arrives from FCC (or listed in FCC database)

You may use all General class privileges as soon as receive the CSCE. As long as you have a call sign in the FCC database, you don't need to wait for the FCC update.

- But, add an indicator to your call sign!
  - Using voice, say "slash AG" … CW or digital modes, add "/AG"

Sample CSCE

American Radio Relay League VEC
Certificate of Successful Completion of Examination

ARRL The national association for AMATEUR RADIO

Test Site (City/State): Newington, CT Test Date: 1/23/19

CREDIT for ELEMENTS PASSED VALID FOR 365 DAYS
You have passed the written element(s) indicated at right. Your will be given credit for the appropriate examination element(s), for up to 365 days from the date shown at the top of this certificate.

LICENSE UPGRADE NOTICE
If you also hold a valid FCC-issued Amateur radio license grant, this Certificate validates temporary operation with the operating privileges of your new operator class (see Section 97.9[b] of the FCC's Rules) until you are granted the license for your new operator class, or for a period of 365 days from the test date stated above on this certificate, whichever comes first.

LICENSE STATUS INQUIRIES
You can find out if a new license or upgrade has been "granted" by the FCC. For on-line inquiries see the FCC Web at http://wireless.fcc.gov/uls/ ("Click on Search Licenses" button), or see the ARRL Web at http://www.arrl.org/fcc/search; or by calling FCC toll free at 888-225-5322; or by calling the ARRL at 1-860-594-0300 during business hours. **Allow 15 days from the test date before calling.**

NOTE TO VE TEAM:
COMPLETELY CROSS OUT ALL BOXES BELOW THAT DO NOT APPLY TO THIS CANDIDATE.

The applicant named herein has presented valid proof for the exam element credit(s) indicated below.
Element 3 credit
Element 4 credit

EXAM ELEMENTS EARNED
~~Passed written Element 1~~
Passed written Element 3
~~Passed written Element 4~~

NEW LICENSE CLASS EARNED
~~TECHNICIAN~~
GENERAL
~~EXTRA~~
~~NONE~~

THIS CERTIFICATE IS NOT A LICENSE, PERMIT, OR ANY OTHER KIND OF OPERATING AUTHORITY IN AND OF ITSELF. THE ELEMENT CREDITS AND/OR OPERATING PRIVILEGES THAT MAY BE INDICATED IN THE LICENSE UPGRADE NOTICE ARE VALID FOR 365 DAYS FROM THE TEST DATE. THE HOLDER NAMED HEREON MUST ALSO HAVE BEEN GRANTED AN AMATEUR RADIO LICENSE ISSUED BY THE FCC TO OPERATE ON THE AIR.

Candidate's Signature Amanda Grimaldi Call Sign N1NHL (If none, write none)
Candidate's Name Amanda Grimaldi
Address 225 Main Street
City Newington State CT ZIP 06111

VE #1 Maria Somma AB1FM (Signature / Call Sign)
VE #2 Steve Ewald WV1X (Signature / Call Sign)
VE #3 Penny Green W1YO (Signature / Call Sign)

COPIES: WHITE–Candidate, YELLOW–VE Team, PINK–ARRL VEC
MVE 07/2015

Figure 3.2 — The CSCE (Certificate of Successful Completion of Examination) is your test session receipt that serves as proof that you have completed one or more exam elements. It can be used at other test sessions for 365 days.

Credit for Previous Licenses

As of 2019, amateurs with expired licenses may receive credit for exam elements passed. Specifically …

- If you pass Element 2 (tech) exam, and provide documentation for previously-held General, Advanced, or Amateur Extra licenses, you will be credited with having passed those written exam elements

Control Operator Privileges & Rules

With so many new privileges, keep a reference handy (next slide)

- When you tune bands, check to make sure you're within the proper segment before transmitting (several questions on this)

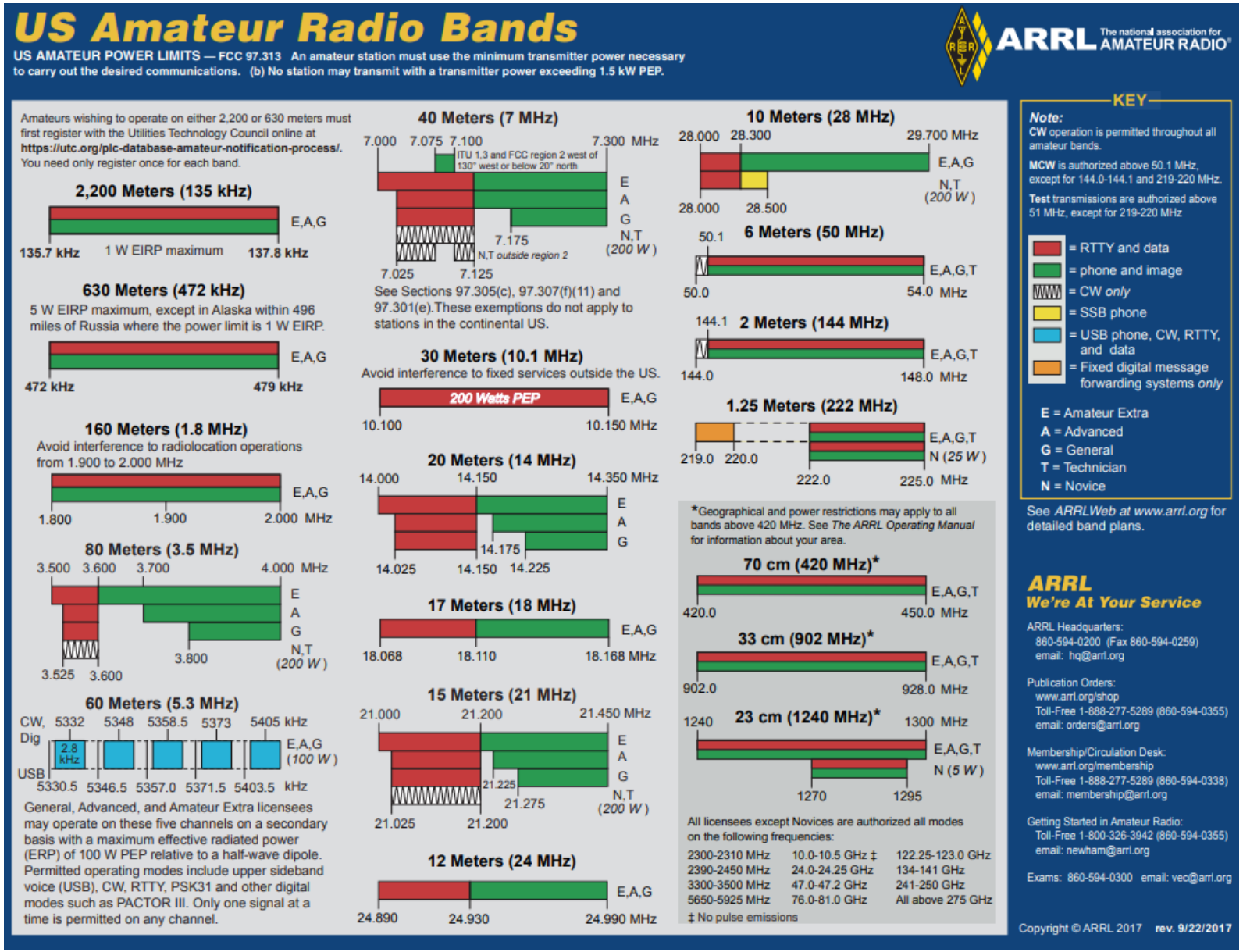
Generals have FULL privileges on 160, 60, 30, 17, 12, and 10 meters

- There are portions of 80, 40, 20, and 15 meters where Generals cannot transmit

Repeater operation on HF is limited on 10 meters from 29.6 to 29.7 MHz

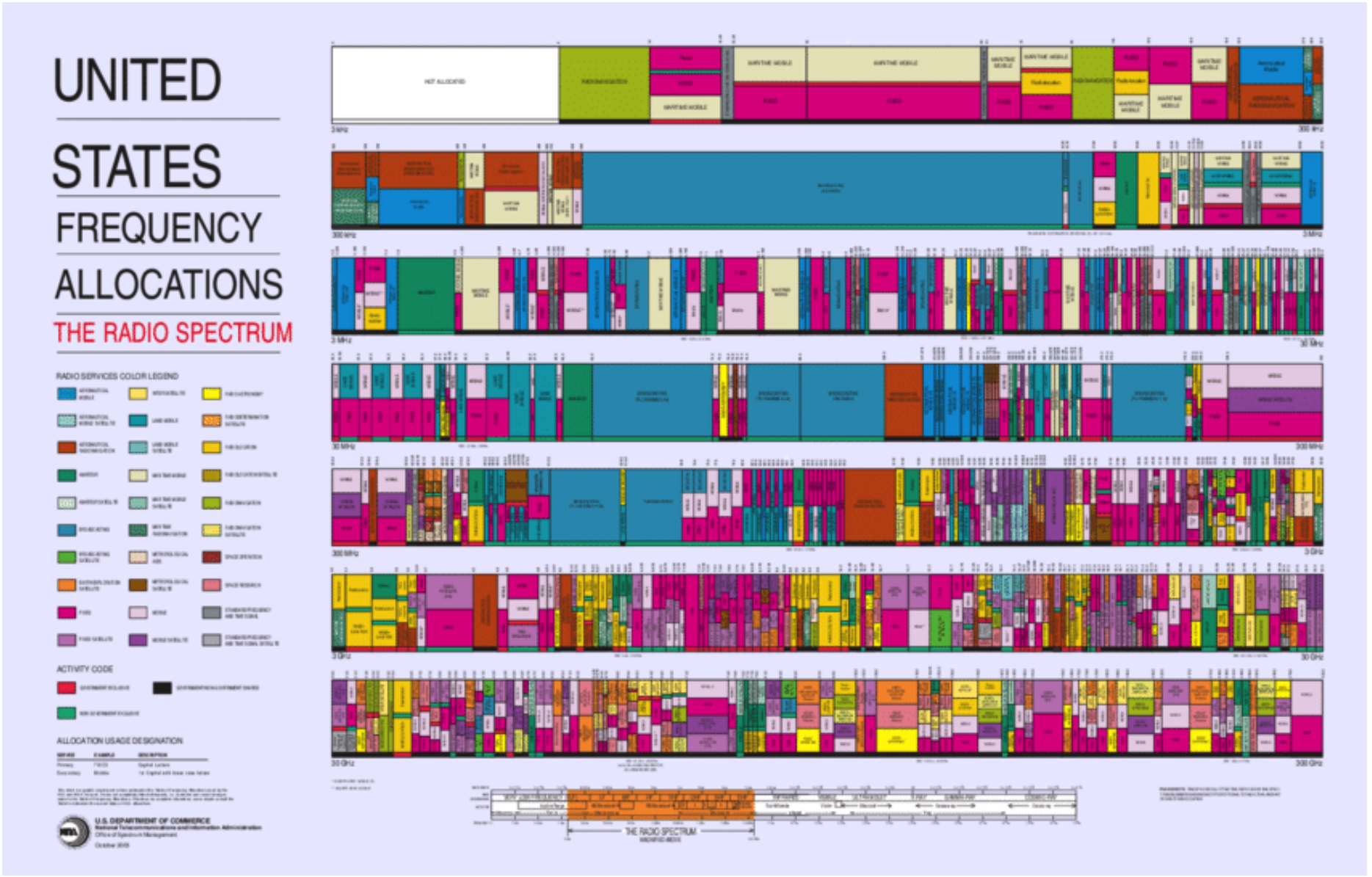
Two HF bands have special regulations …

- 60 meters only permit channelized operation on USB, CW, and certain digital modes with power limit of 100 V ERP (effective radiated power)
- 30 meters permit only CW, RTTY, and data signals with limit of 200 W PEP



FREQUENCY PRIVILEGES

www.arrl.org/graphical-frequency-allocations


UNITED
STATES
FREQUENCY
ALLOCATIONS
THE RADIO SPECTRUM
RADIO SERVICES COLOR LEGEND
ACTIVITY CODE
ALLOCATION USAGE DESIGNATION
U.S. DEPARTMENT OF COMMERCE
THE RADIO SPECTRUM

Control Operator Privileges & Rules (cont.)

In some bands, amateurs share access with other services

- Called secondary amateur allocations (primary services have priority); the amateur station must clear the frequency
- Hams are not allowed to contact the primary service
  - Example: Hams share part of the 13-cm spectrum with Wi-Fi channels, but amateurs may not communicate with unlicensed Wi-Fi stations

Amateurs are required to take special steps to mitigate interference in the following circumstances …

- Operating within one mile of an FCC Monitoring Station
- Transmitting spread spectrum (SS) emissions
- Using a band where the Amateur Service is secondary

Beacons

Used for observation of propagation and reception and related activities

Useful on HF, VHF, and UHF bands

Beacon rules contained in §97.203 … most important ones …

- No more than one signal in the same band from a single location
- Limited to 100 W PEP output

Only HF band where automatically controlled beacons can operate: 28.2 to 28.3 MHz

Avoid transmitting on international beacon frequencies operated by Northern California DX Foundation (www.ncdxf.org)

Summary of Amateur HF Bands (Table 3.2)

WAVELENGTH (meters)	FREQUENCY (MHz)
160	1.800 – 2.00
80 and 75	3.500 – 3.600 and 3.600 – 4.000
60	5.3305, 5.3465, 5.3570, and 5.4035 (USB carrier frequency)
40	7.000 – 7.300
30	10.100 – 10.150
20	14.000 – 14.350
17	18.068 – 18.168
15	21.000 – 21.450
12	24.890 – 24.990
10	28.000 – 29.700

NOTE: On 60 meters, CW, and digital emissions must be centered 1.5 kHz above the carrier frequencies indicated above. Only one signal at a time is permitted on any channel.

Third-Party Traffic

Definition: Sending messages on behalf of someone else who is not an amateur

Foreign governments have an interest in limiting this because it bypasses normal Internet, telephone, and postal systems

FCC recognizes the value … wants people trained to provide effective emergency communications

Handling 3rd party messages is called passing traffic

3rd party traffic must be exchanged between amateur stations operating under FCC rules …

- Non-commercial & either be personal and unimportant OR relating to emergencies or disaster relief

Third-Party Traffic (cont.)

3rd Party is the person or entity on whose behalf the message is being sent (may be an organization)

3rd Party does not need to be present

3rd party traffic CANNOT be exchanged on behalf of an amateur whose license has been suspended or revoked

Question arises … May third-party messages be transmitted via remote control?

- YES: Under the same circumstances in which third party messages are permitted by FCC rules!

MORE INFO: www.arrl.org/third-party-operating-agreements

Prohibited & Restricted Communications

One-way transmissions not permitted, except for code practice

Can’t retransmit a broadcast, except for weather or propagation predictions from US government stations (as long as it’s occasional)

It’s permitted for US amateurs to communicate with amateur stations in countries outside the areas administered by the FCC unless the country has notified the ITU that it objects

Codes intended to obscure meanings of messages are prohibited

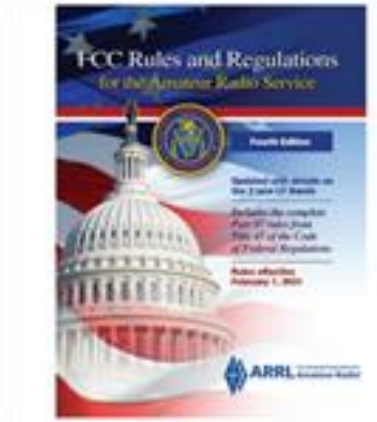
Prohibited & Restricted Communications (cont.)

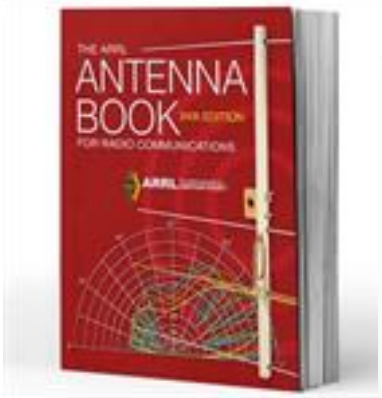
On terrestrial cross-band repeaters that receive signals on one frequency band and retransmit them on another frequency band, such transmissions are permitted if the control operator of the repeater transmitter that operates on the HF band has a General class license or higher

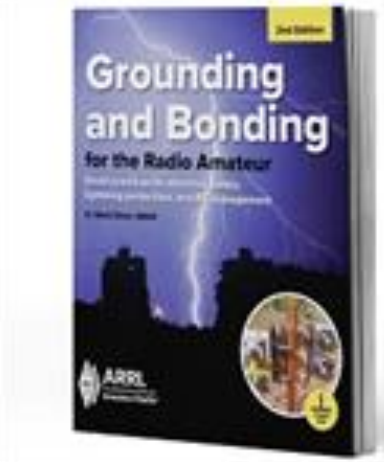
Technical Rules and Standards

Good Amateur Practices …

- Not all procedures are covered in the exam or by FCC Part 97 rules
- Amateurs themselves set day-to-day operating standards, although the FCC reserves the right to rule on what is and isn't good engineering and good amateur practice
- Many sources available cover these practices, including …
  - ARRL Handbook
  - ARRL Antenna Book
  - ARRL Grounding and Bonding
  - FCC Rules and Regulations







Technical Rules and Standards

- Club websites --
  - W6EK.org – Sierra Foothills Amateur Radio Club
  - N6NA.org – River City Amateur Communications Society (River City ARCS)
  - K6IS.org – North Hills Radio Club
  - Barkradio.org – Berryessa Amateur Radio Klub (KE6YUV)
  - YSARC.net – Yuba-Sutter Amateur Radio Club (WD6AXM)

- Amateur Radio Emergency Service (ARES)
  - Sacramento County
  - Placer County
  - Yolo County
  - Yuba County

Output Power

General, Advanced, and Amateur Extra limited to max transmitter output of 1500 W PEP (peak envelope power) on HF bands

Two Q-signals for indicating power level …

- QRP: Reduce power or I am using low power (usually 5W or less)
- QRO: Increase power or I am using high power

Two max power restrictions on HF …

- 200 W PEP on 30 meters (10.1 MHz)
- 100 W PEP with respect to half-wave dipole on 60 meters (5 MHz) with max bandwidth of 2.8 kHz

Output Power (cont.)

Novice and Technician licensees operating on HF are limited to 200 W PEP output

General, Advanced, and Extra licensees may use full 1500 W PEP output in the former Novice segments on 80, 40, and 15 meters

Since spread spectrum creates a noise-like signal that can affect other users, the output power limit for amateurs for SS signals is 10 watts

FCC requires amateurs to use the minimum power necessary to carry out the desired communication

Digital Transmissions

FCC rules for digital transmissions are primarily concerned with the bandwidth of the transmitted signal

- Bandwidth is tied to the symbol rate … signal events per second
- Covered in §97.305(c) and §97.307(f) … see Table 3.4 (next slide)

As the size of the amateur bands increases with frequency, faster (wider) signals are allowed

- At 33 cm (902 MHz) and above, there is no limit except for the band edges themselves

Max Symbol Rates & Bandwidth (Table 3.4)

BAND	SYMBOL RATE (baud)	BANDWIDTH (kHz)
160 thru 12 m	300	1
10 m	1200	1
6 m, 2 m	19.6k	2
1.25 m, 70 cm	56k	100
33 cm and above	No limit	No limit

There are new protocols being introduced all the time. The FCC recognized the need for amateurs to receive and understand signals must be balanced with the benefits of innovation. This is why the FCC requires the technical characteristics of the protocol be publicly documented before using it on the air.

QUESTIONS?

ONLINE EXAM REVIEW AND PRACTICE QUESTIONS:

http://www.arrl.org/examreview