

Chapter 3

Rules & Regulations

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Operating Standards

- As an Extra class licensee, your growing experiences will expose you to a wider variety of operating situations and circumstances.
- Most obvious new experiences will be with your new and exclusive HF operating privileges

Operating Standards

- Frequency and Emission Privileges
 - Extra's have all the amateur frequency privileges on all amateur bands (Table 3-1 & 3-2 for HF)
 - Each different ITU Region has different amateur frequency privileges
 - The USA is in Region 2, where Region 2 frequency rules apply

Operating Standards

- **Special Restrictions:**
 - **30-meter** band is a secondary basis, limited to 200 watts, CW or Data only (USA)
 - **60-meter** band is restricted to 5 channels on a secondary basis
 - 5 channel specified as center frequencies
 - 1.5 kHz SSB display offset
 - 2.8 kHz bandwidth
 - USB only for phone
 - 100 watts ERP
 - RTTY & Data, no automatic control

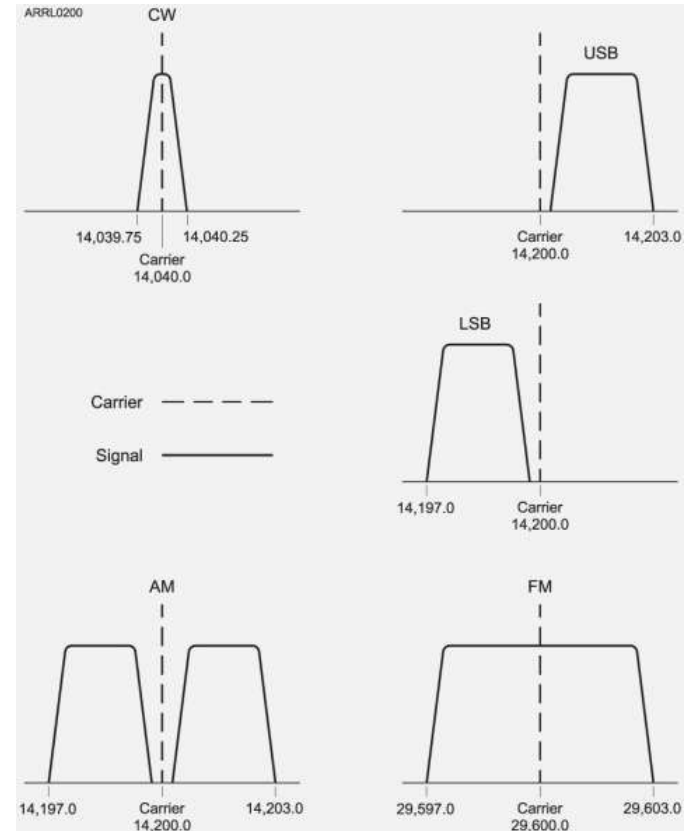


Figure 3-1
Pg. 3-5

Operating Standards

- Automatic Message Forwarding
 - Amateurs are held accountable for any message transmitted from their station
 - 3rd party messages relayed are easy to follow
 - Automatic forwarding does not allow control operators to screen every message
 - FCC Rules were modified making the originating station primarily responsible
 - 1st relay station bears some responsibility, 2nd on none
 - Discontinue forwarding the message if it violate FCC Rules

Operating Standards

- **Races Operation**

- An amateur radio service of amateur stations for civil defense communications during periods of local, regional or national civil emergencies
- RACES is a formal FCC service
 - Amateurs are required to register with their local Civil Defense organization
 - All amateur frequencies are available to stations participating in RACES operations
 - RACES stations communicate with other RACES stations and other stations authorized by the civil defense official

Station Restrictions

- Operating Restrictions:
 - Under certain conditions, the FCC may modify the terms of your license
 - Interference between properly operating amateur stations and users of other license services (US Govt)
 - General interference may result in “Quiet Hours”
 - Amateur station must operate within the rules and without “spurious emissions” (frequencies outside of the necessary bandwidth of a transmission, 43 dB below the mean power of the fundamental signal)

Operating Restrictions

- **Station Location and Antenna Structures**
 - **Location**: If the land has environmental importance or it is significant in American history, architecture or culture, you may be required follow special rules
 - Designated wilderness area, wildlife preserve or listed in the National Register of Historical Places, you must submit and Environmental Assessment to the FCC
 - If your station is located within 1 mile of an FCC monitoring facility, you must protect that facility from harmful interference (Table 3-4 on pg. 3-9)
 - **Antenna Structures**: over 200 ft. or near a public use airport (FAA) has limitations

Station Control

- With the Internet connected directly to the radio and all manner of “Smart Devices” that will allow the equipment to work in concert, the possibilities are endless.
- The control operator doesn't have to be the station owner and doesn't even have to be physically present at the transmitter
 - Someone must be responsible for all amateur transmissions whether the equipment is directly supervised or not

Station Control

- **Local Control**

- The FCC defines local control as “the use of a control operator who directly manipulates the operating adjustments in the station to achieve compliance with the FCC Rules.”

- Rules don't say by hand, or via computer, or even a voice-activated speech system
 - If you are present at the station, that's local control
 - Turning a VFO knob or pushing the PTT is local control

Amateur-Satellite Service

- **Definitions:**

- Amateur-satellite service: Radio communications service using stations on Earth satellites for the same purpose as the amateur service.
- Earth Stations: Stations operating at or within 50 km of the Earth's surface
- Space Station: Amateur station located above 50 km from the Earth's surface
- Telecommand: One-way transmission to initiate, modify or terminate functions of a device at a distance
- Telecommand Station: An amateur station that transmits telecommand control functions
- Telemetry: One way transmission of measurements from measuring instruments

Amateur-Satellite Service

- Telecommand & Telemetry: provides a way to remotely control various function of the satellite
 - FCC allows telecommand transmissions to use special codes to intentionally obscure the meaning of the message. (secure encryption)
 - Satellite telemetry might indicate the state of battery charge, transmitter temperature or other spacecraft conditions

Amateur-Satellite Service

- Satellite Licensing & Frequency Privileges
 - Any licensed Amateur Radio operator may be the control operator of a space station
 - Any Amateur Radio station can also be a space station (assuming you can get it there)
 - One special telecommand function required by the FCC – must be able to turn the station OFF!
 - Frequencies:
 - HF – 17, 15, 12, 10 & portions of the 40 & 20 meters
 - VHF/UHF – segments of 2-meters, 70cm, 23cm & 13cm

Volunteer Examiner Program

- The Volunteer Examiner Coordinator
 - VEC Accredits licensed Amateur Radio Operators
 - VEC does not grade exams
 - VEC is responsible for recruiting and training Volunteer Examiners
 - The VEs determine where and when to hold license exam sessions

Volunteer Examiner Program

- Accreditation

- VEC accredits a VE certifying they meet the qualifications to perform all the duties required
 - 18 yrs old or older
 - General class license or higher
 - (General test Techs, Advanced & Extra test Generals, only Extras can test Extras)
 - Never had license suspended or revoked

- Exam Preparation

- VEC Coordinates the preparation and administration of exams
 - ARRL VEC provides the test material & forms including exam software to their VEs
 - VEC collects the completed exam documents and reviews them to ensure accuracy
 - Forwards the documents to the FCC for a new license to be issued

- VEC cooperates in the development and maintenance of the question pool used on the exams (QPC).

Volunteer Examiner Program

- Exam Session Administration
 - Every exam session must be coordinated by a VEC
 - Exam VEs must be accredited by the coordinating VEC
 - It takes 3 VEs to administer an exam session
 - You don't have to be a member of the ARRL to be an ARRL accredited VE (membership is not required)
 - VEs can not test family members

Volunteer Examiner Program

- Exam Session Administration
 - VE Duties During the Exam Session
 - Supervise the exam session (ensure proper conduct)
 - Must be present during the entire exam session
 - Ensure candidates follow the VE instructions
 - Failure to comply with instructions terminates the exam
 - VE collect and grade exams (74% is passing)
 - VE notify candidates whether they passed or failed the exam
 - VEs issue a CSCE to those who pass to certify their qualifications

Volunteer Examiner Program

- After the Exam
 - The VE team must submit the application forms and test papers for all the candidates who passed to the coordinating VEC (Within 10 Days)
- Re-administration of Exams
 - The FCC has the authority to re-administer exam elements to any licensee
 - Testing irregularities
 - FCC determines a fraudulently administered or certified exam
 - The FCC may designate a specific VEC to re-examine elements
 - If you fail to appear for re-examination, the FCC will cancel your license

Miscellaneous Rules

- Auxiliary Stations
 - Are amateur station, other than in messaging forwarding system, that transmit communications point-to-point within a system of cooperating amateur stations
 - Links to remotely controlled stations
 - Cross-band repeat stations

Miscellaneous Rules

- External Power Amplifiers
 - RF power amplifiers capable of operating on frequencies below 144 MHz may require FCC certification
 - Certification
 - Satisfy the spurious emission standard
 - Must not be capable of amplifying the input signal by more than 15dB
 - Must not amplify between 26 and 28 MHz (CB)
 - Amateurs may build their own amplifier or modify amplifiers for use in an Amateur Radio station without concern for the certification rules
 - Dealers may sell non-certified amplifiers if they were purchased in used condition and resold to another amateur

Miscellaneous Rules

- Line A & National Quiet Zones (Fig. 3-4, pg. 3-20)
 - The 420-430 MHz band segments
 - Canada has allocated this segment to fixed and mobile service
 - USA (remember treaties) amateurs are not permitted to transmit on these frequencies north of the boundary line along the boarder with Canada (see fig. 3-4)
 - Quiet Zones: 50 mile radius centered on Buffalo, NY, Detroit, MI, Cleveland, OH
 - Quiet Zones: Area surrounding the National Radio Astronomy Observatory Maryland, West Virginia and Virginia (National Radio Quiet Zone)
 - Quiet Zones: Area surrounding Naval Research Laboratory at Sugar Grove, West Virginia

Miscellaneous Rules

- Business & Payment

- No transmissions are permitted in which you or your employer have a pecuniary (monetary) interest
- Your personal activities don't count as business
 - Talking to your spouse about shopping
 - Order a pizza over a phone patch
 - Radio swap nets on the air (usually close deal on phone) Don't do it regularly or can become a business
- No compensation for communications directly or indirectly (Not for Hire or Trade)

Miscellaneous Rules

- Spread Spectrum Operation
 - SS communications is a signal-transmission technique in which the transmitted carrier is spread out over a wide bandwidth (*Bandwidth Expansion Modulation*)
 - Spread a little power over a wide bandwidth to minimize interference rather than concentrating a lot of power in a narrow bandwidth
 - SS transmission are permitted as long as they don't cause interference
 - SS transmissions must not be used to obscure the meaning on any communications
 - FCC limits maximum transmitter power for spread spectrum to 10 watts
 - Operation of spread spectrum is restricted to frequencies above 222 MHz

Miscellaneous Rules

- Non-US Operating Agreements
 - (CEPT) European Conference of Postal and Telecommunications Administrations radio license
 - Allows US amateurs to travel and operate from most of European countries
 - Amateurs from CEPT countries can operate in the USA
 - (IARP) International Amateur Radio Permit
 - Allows for operations in certain countries in Central and South America without seeking a special license or permit to enter and operate from that country
 - (ITU) Reciprocal Permit is an agreement between the US and a country that does not participate in either CEPT or IARP agreements

Miscellaneous Rules

- Special Temporary Authority
 - Occasionally, a new mode is developed that is not covered under existing FCC rules
 - (STA) – Special Temporary Authority can be granted for experimental amateur communications
 - Spread Spectrum was an example
 - 500 kHz communications
 - STAs are temporary, lasting long enough for experiments to be performed and information accumulated
 - STAs don't give amateurs exclusive use of a frequency nor does it waive all the rules
 - STAs may result in changes to the FCC rules but is not a waiver of any rule

Homework

- **Read Chapter 4**
 - Do practice questions in the textbook
 - Practice Chapter 2, 3 & 4 on the practice exam CD
 - Expect next week's class to run late