

General License Class

Session 2, Part 1

Rules and Regulations

Presented by:

Kevin Weiler, K6XXX
Foothills Amateur Radio Society

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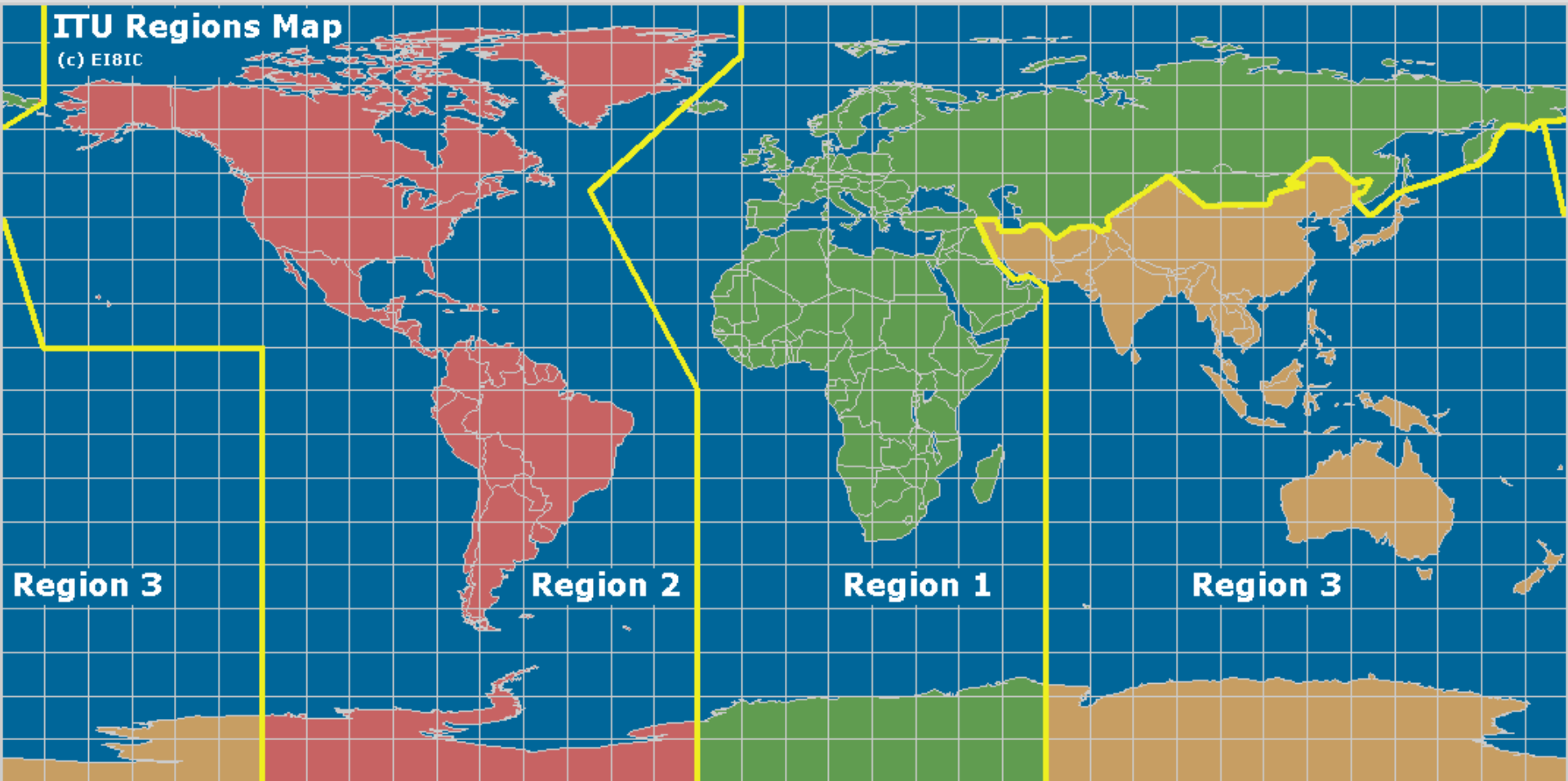


Regulatory Bodies

- **ITU (International Telecommunications Union)**
 - Responsible for all international radio regulations
 - Three administrative regions
 - Most of US territories is in region 2 (a few in region 3)
 - Amateur frequency allocations vary slightly in different regions



ITU Regions



Regulatory Bodies

- **FCC Federal Communications Commission**
 - FCC is US agency responsible for radio communication regulation in US territories
 - **Amateur Auxiliary**
 - **Amateur volunteers who are formally enlisted to monitor the airwaves for rules violations**
 - Objectives are to **encourage amateur self-regulation and compliance with the rules**
 - Skills learned during “Fox Hunts” that are helpful include **direction-finding skills useful to locate stations violating FCC rules**



Regulatory Bodies

- **FAA Federal Aviation Administration**
 - If you construct an antenna structure greater than **200 feet tall** you must notify the FAA and register it with the FCC
 - If such an antenna is 4 miles or closer to an airport there are additional restrictions



Amateur Licensing Rules

- **License Elements**
 - **Element 2: Technician License test**
 - **Element 3: General License test**
 - **Element 4: Amateur Extra License test**
 - **Element 1 (no longer used): 5 wpm Morse code exam**



Amateur Licensing Rules

- **Examiner Rules**

- VECs (Volunteer Examiner Coordinators) administer the licensing program and examinations under agreement with the FCC. There are 14 of them.
- VEs (Volunteer Examiners)
 - **Must be accredited by a VEC**
 - **Must be 18 years of age**
 - **Must be General or higher; but need not be a US citizen**
 - **Must not have had your license revoked**
- VE must have a higher level license to give an exam (except Extra)
 - **example: if have a General you can test a Technician**



Amateur Licensing Rules

- **Examination Rules**
 - Technician Class exams require **at least 3 VEC accredited General Class or higher VEs be present**
 - At a Volunteer Exam Session, **the administering VEs** are responsible for determining correctness of the answers
 - When you pass an exam, you are issued a **CSCE** (Certificate of Successful Completion of Examination)
 - CSCEs are valid for credit for **365 days**



Amateur Licensing Rules

- **Identification Requirements**
 - If you have your Technician license in the FCC Database, and passed your General and have your CSCE, but it is not yet in the FCC ULS database
 - You can transmit **on any General Class band segment**
 - **When using General Class frequencies** you must identify by **giving your call sign followed by “temporary AG”** or **“/AG”**
 - You may use any language for a contact, but **you must identify in English**



Control Operator Privileges

- **Frequency Privileges**
 - 1.8 – 3.5 – 7 – 14 – 21 – 28 MHz
 - 160 – 80 – 40 – 20 – 15 – 10 meters
 - Since 1980 added
 - WARC bands(30m, 17m, 12m) and 60m
 - 60m is channelized SSB
 - **No band is shared** with Citizens band



Control Operator Privileges

- Frequency Privileges: HF Bands**

Wavelength (m)	Frequency (MHz)
160	1.800-2.00
80 and 75	3.5-3.750 and 3.750-4.000
60	5.332 ...5.405
40	7.000-7.300
30	10.100-10.150

Wavelength (m)	Frequency (MHz)
20	14.000-14.350
17	18.068-18.168
15	21.000-21.450
12	24890-24.990
10	28.000-29.700

$$300 \div \text{frequency (MHz)} = \text{wavelength (m)}$$



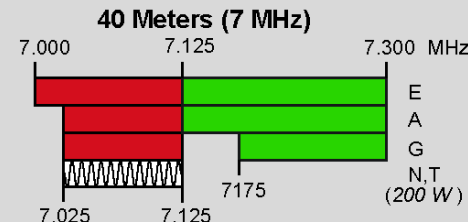
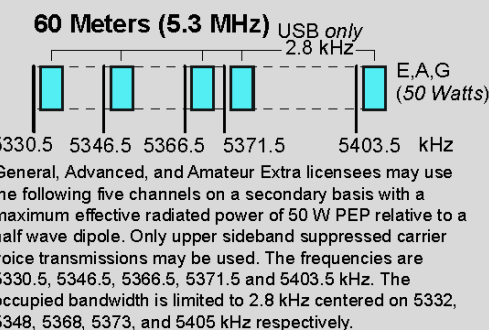
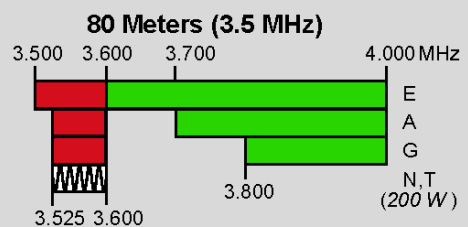
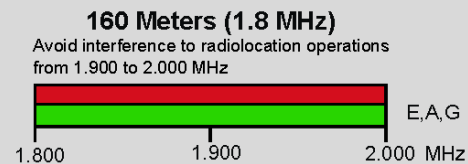
US Amateur Radio Bands

US AMATEUR POWER LIMITS

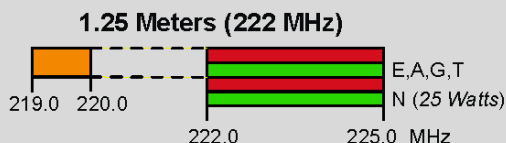
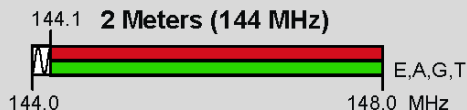
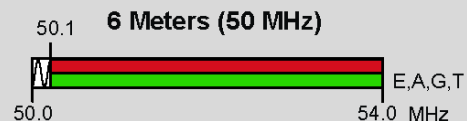
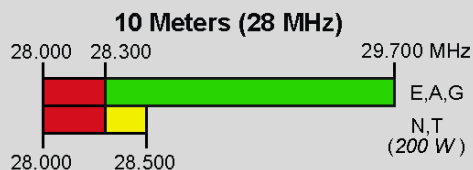
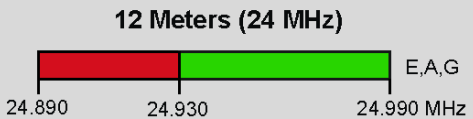
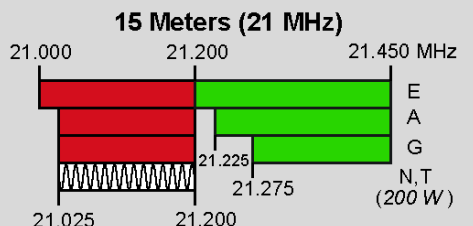
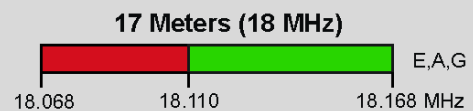
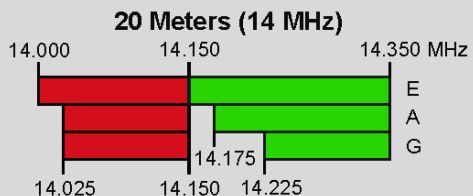
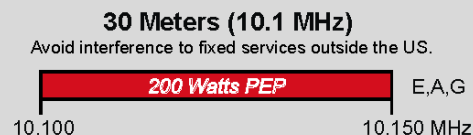
At all times, transmitter power should be kept down to that necessary to carry out the desired communications. Power is rated in watts PEP output. Except where noted, the maximum power output is **1500 Watts**.

Effective Date
February 23, 2007

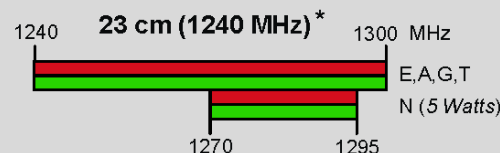
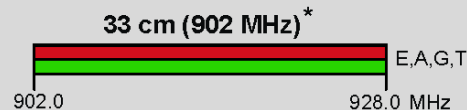
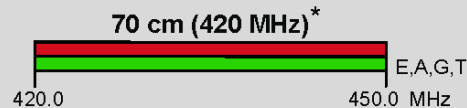
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Phone and Image modes are permitted between 7.075 and 7.100 MHz for FCC licensed stations in ITU Regions 1 and 3 and by FCC licensed stations in ITU Region 2 West of 130 degrees West longitude or South of 20 degrees North latitude. See Sections 97.305(c) and 97.307(f)(11). Novice and Technician licensees outside ITU Region 2 may use CW only between 7.025 and 7.075 MHz. See Section 97.301(e). These exemptions do not apply to stations in the continental US.



*Geographical and power restrictions may apply to all bands above 420 MHz. See *The ARRL Operating Manual* for information about your area.



All licensees except Novices are authorized all modes on the following frequencies:

2300-2310 MHz	10.0-10.5 GHz	122.25-123.0 GHz
2390-2450 MHz	24.0-24.25 GHz	134-141 GHz
3300-3500 MHz	47.0-47.2 GHz	241-250 GHz
5650-5925 MHz	76.0-81.0 GHz	All above 275 GHz

KEY

Note:
CW operation is permitted throughout all amateur bands except 60 meters.

MCW is authorized above 50.1 MHz, except for 219-220 MHz.

Test transmissions are authorized above 51 MHz, except for 219-220 MHz

- = RTTY and data
- = phone and image
- = CW only
- = SSB phone
- = USB phone only
- = Fixed digital message forwarding systems only

- E** = Amateur Extra
- A** = Advanced
- G** = General
- T** = Technician
- N** = Novice

See *ARRLWeb* at www.arrl.org for more detailed band plans.

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Control Operator Privileges

- **Frequency Privileges**

- Generals have ALL privileges on **160m**, 60m, **30m**, **17m**, **12m**, **10m** – only 160m, 10m (top, bottom) from the original 6 bands
- When limited, General frequencies are at the **upper end** of the band (in frequency)
- There is no *phone operation* or *image transmission* on **30m**
- Channelized USB voice only **on the 60m band**



Control Operator Privileges

- **Transmission Definitions**

- **Emission Designators**

- Letter for modulation followed by number for type of signal followed by letter for the type of information
 - Examples
 - A1A: amplitude modulated telegraphy for aural reception (CW)
 - F3E: Frequency modulated telephony (FM)
 - J3E: Single sideband suppressed carrier telephony (SSB)
 - For details see link from ARRL site:
<http://www.arrl.org/general-class-license-manual>



Control Operator Privileges

- **Transmission Definitions**

- **Beacons**

- Used for **observation of propagation and reception, or other related activities**
- Limited to **100 W PEP**
- **Must not be more than one in same band from same location**



Control Operator Privileges

- **Interference Definitions**
 - **Unintentional**
 - **Harmful**
 - Degraded or interrupted communications
 - **Willful**
 - Never acceptable when intentional



Control Operator Privileges

- **Interference Definitions**
 - FCC can restrict amateurs causing interference to receivers of good design **to times other than 8pm-10:30pm and Sunday from 10:30am-1pm**
 - An amateur radio station must take specific steps to avoid interference **when within 1 mile of an FCC monitoring station, when operating as a secondary service, when operating spread spectrum: ALL OF THESE**



Control Operator Privileges

- **Interference Definitions**

- **Repeater Coordination**

- Volunteer regional repeater coordinators / frequency coordinators assign repeater frequencies to prevent interference
 - If interference between coordinated and uncoordinated repeaters **the licensee of the non-coordinated repeater has primary responsibility to resolve the interference**

- **Primary vs. Secondary Users**

- When amateur service is secondary, **you can use the band only if it does not cause interference to primary users**
 - In 30m or 60m band you are secondary and
 - if a primary user interferes with your contact **you must stop transmitting at once and move to a clear frequency**
 - You must not cause harmful interference to other stations in other services



Control Operator Privileges

- **Third Party Traffic**

- **Third party traffic is when a message (text, data, voice, image) is sent on behalf of another entity**

- Ham → Ham → non-Ham
- Non-Ham → Ham → Ham
- Ham → Ham → Ham is not a third party communication
- Third party need not be present at station

- **Third party cannot state message over amateur radio if **they were previously licensed but had license revoked****



Control Operator Privileges

- **Third Party Traffic**
 - **International: Third party traffic is prohibited except for US and any country which has a third party agreement in effect**
 - **Types of allowed messages for a third party in another country: messages related to amateur radio or remarks of personal character, or emergency or relief messages**



Control Operator Privileges

- **Prohibited and Restricted Communications**
 - **Prohibited:**
 - Music
 - Obscene/indecent
 - False/deceptive messages
 - **ALL OF THESE**
 - **Restrictions on abbreviations or procedural signals: can be used if do not obscure meaning of message**



Control Operator Privileges

- **Prohibited and Restricted Communications**
 - Music may be transmitted **when it is an incidental part of a space shuttle or ISS retransmission**
 - An amateur station can transmit secret codes **to control a space station**



Control Operator Privileges

- **Prohibited and Restricted Communications**
 - Can transmit if have pecuniary interest **if notifying of sale of amateur equipment, but not on a regular basis**
 - A station that simultaneously retransmits signals of another station on another channel is a **repeater station** (not beacon or relay)
 - 10m repeater can transmit a 2m signal from a technician **if the 10m control operator holds at least a General license**



Control Operator Privileges

- **Written Records**

- Information traditionally contained in a station log:
 - Date & time of contact
 - Band and/or Frequency
 - Call sign of contact station and signal report
 - **ALL OF THESE**
- Many keep a log even if not required by the FCC **to help reply if FCC requests info on who was control operator on a given date and time**
- For 60M only, if you are using other than a dipole antenna, **you must keep a record of the gain of your antenna**



Typical Logbook

Amateur Radio Station Log

Date	Time UTC		Frequency (MHz)	Mode	Power (dBW)	Station Called/Worked	Report		QSL		Remarks
	Start	Finish					Sent	Rec'd	Sent	Rec'd	



Typical QSL Card



In the foothills just west of Silicon Valley, Puzo the llama stands guard against mountain lions and bobcats. Just over the hills lies Stanford University and Silicon Valley, where entrepreneurs still search for their pot of gold.



KG6YYW

Kevin Weiler
 14341 Liddicoat Circle
 Los Altos Hills California 94022
 USA

CONFIRMING QSO WITH	DATE			UTC	MHz	Report		2-WAY MODE
	DA	MO	YR			Sent	Rcvd	

Equipment: TS2000 @100 watts, G5RV

Mobile Portable

QSL: PSE TNX!

73!

Technical Rules and Standards

- **Good Amateur Practices**
 - FCC requires an amateur station to be operated (if not covered by Part 97 rules) in conformance with **good engineering and good amateur practice**
 - The **FCC** determines what is “good engineering and good amateur practice”



Technical Rules and Standards

- **Transmitters and Amplifier Power**
 - **1500W Peak Envelope Power (PEP)**
 - Use minimum power necessary
 - **50W PEP on 60m**
 - On 60m maximum bandwidth of 2.8kHz USB
 - **200W PEP on 30m (10.140 MHz)**
 - **QRP is low power transmit operation, typically about 5W**



Technical Rules and Standards: Digital Transmissions

Band	Symbol Rate (Baud)	Bandwidth (KHz)
Below 28MHz (10m)	300	1
10m	1200	1
6m, 2m 6m, 2m	19.6k	20
1.25m, 70cm	56k	100
33cm and above	No limit	No limit



References / Acknowledgements

- **ARRL Band Chart**

http://www.arrl.org/FandES/field/regulations/Hambands_color.pdf

- **ITU Regions**

<http://www.mapability.com/ei8ic/maps/regions.php>

- **Logbook**

<http://www.diyplanner.com/node/6843>

