

General License Course

Chapter 3.1

- Regulatory Agencies

International Telecommunications Union

- ITU is the organization responsible for all international radio regulations

- Radio knows no geographical boundaries
- Each nation agrees by treaty to abide by those regulations
- Each country decides how to administer and implement those regulations (This is the role of the FCC in the USA)



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FCC Structure and Authority

- The Federal Communications Committee (FCC) was established by the Communications Act of 1934
 - Regulates interstate and international communications by radio, television, wire, satellite and cable
- FCC jurisdiction covers the 50 states, District of Columbia, U.S. possessions and territories, and USA-flagged vessels



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ITU

- The world is divided into 3 ITU regions



North and South America
are in Region 2

Different ITU regions have
different frequency
privileges.

FCC-licensed amateurs
may have different
frequency allocations when
operating outside Region 2



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Remote Operation

When operating a US station via remote control the control operator must hold a US operator/primary station license

When operating a station in another country via remote control the regulations of the remote station's country apply

Volunteer Monitoring Program

- Composed of ARRL volunteer-appointees, the VMP was created to assist the FCC

Monitoring the bands

Notifying amateurs of technical and operating discrepancies (or complimenting good operation)

The **mission** of the VMP is to encourage self-regulation and compliance with the FCC rules



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Good Operator Report

Radio: K8NV your call was heard (calling) (working) DL1RAW 1910 - ZS3JP at 1940 UTC.
Date: Oct 20, 2004 Frequency: 21.250 MHz Mode: SSB Your RST 59

We thought you would like to know

That this Official Observer has noted your EXCELLENT radio signal quality/operating procedure as a fine example for all radio amateurs.

Remarks: Your outstanding courtesy to foreign amateurs, including
using their language, compliments on their countries, is impressive.
Also, politely letting the other stations who broke in, make contacts
and not trying to hog the frequency, is a fine example for everyone.
This observation by the undersigned ARRL Official Observer is a function of the Amateur Auxiliary to the FCC. This Observer thanks you for your excellent example of good amateur practice for others in the amateur Radio Service. Keep up the good work. 73,

FSD-15(7-04) Signature Carolyn Womack Call KC5OZT

Volunteer Monitoring Program

- In cases involving serious rule violations, such as malicious interference, the VMP is trained and certified to gather and forward evidence that can be used by the FCC in enforcement actions
 - Transmitters (repeaters) stuck on (next slide)
 - Defective equipment (amateur or not)
 - Noise sources
 - Jamming or deceptive signals



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Fox Hunting

- Transmitter Hunting (*Fox Hunting*)
 - Very popular Amateur Radio club activity
 - Competitive radiosport events (especially in Europe)
 - Hand-held directional antennas used to find hidden transmitters



Direction finding and beam heading triangulation skills are used by members of the Volunteer Monitoring Program to locate stations violating FCC rules, continuous carriers, or stations in distress

Federal Aviation Admin Rules

- Amateurs who plan to construct an antenna structure more than 200 feet in height must notify the FAA and register the tower with the FCC
- Additional restrictions may apply if the antenna is within 4 miles of a public use airport or heliport



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More On Towers

- Local building codes may also impact tower plans.
- FCC Rule PRB-1 states that Amateur Radio communications must be reasonably accommodated. Any regulations must be the minimum practical and have a legitimate purpose.



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Take Quiz 1



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G1B01 - What is the maximum height above ground for an antenna structure not near a public use airport without requiring notification to the FAA and registration with the FCC?

- A. 50 feet
- B. 100 feet
- C. 200 feet
- D. 250 feet

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G1B06 - Under what conditions are state and local governments permitted to regulate amateur radio antenna structures?

- A. Under no circumstances, FCC rules take priority
- B. At any time and to any extent necessary to accomplish a legitimate purpose of the state or local entity, provided that proper filings are made with the FCC
- C. Only when such structures exceed 50 feet in height and are clearly visible 1,000 feet from the structure
- D. Amateur Service communications must be reasonably accommodated, and regulations must constitute the minimum practical to accommodate a legitimate purpose of the state or local entity



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G1D05 - When operating a US station by remote control from outside the country, what license is required of the control operator?

A. A US operator/primary station license

B. Only an appropriate US operator/primary license and a special remote station permit from the FCC

C. Only a license from the foreign country, as long as the call sign includes identification of portable operation in the US

D. A license from the foreign country and a special remote station permit from the FCC



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G1D12 - When operating a station in South America by remote control over the internet from the US, what regulations apply?

- A. Those of both the remote station's country and the FCC
- B. Those of the remote station's country and the FCC's third-party regulations
- C. Only those of the remote station's country
- D. Only those of the FCC

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G1E06 - The frequency allocations of which ITU region apply to radio amateurs operating in North and South America?

A. Region 4

B. Region 3

C. Region 2

D. Region 1



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G2D01 - What is the Volunteer Monitor Program?

- A. Amateur volunteers who are formally enlisted to monitor the airwaves for rules violations
- B. Amateur volunteers who conduct amateur licensing examinations
- C. Amateur volunteers who conduct frequency coordination for amateur VHF repeaters
- D. Amateur volunteers who use their station equipment to help civil defense organizations in times of emergency



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G2D02 - Which of the following are objectives of the Volunteer Monitor Program?

- A. To conduct efficient and orderly amateur licensing examinations
- B. To provide emergency and public safety communications
- C. To coordinate repeaters for efficient and orderly spectrum usage
- D. To encourage amateur radio operators to self-regulate and comply with the rules

G2D02 - Which of the following are objectives of the Volunteer Monitor Program?

- A. To conduct efficient and orderly amateur licensing examinations
- B. To provide emergency and public safety communications
- C. To coordinate repeaters for efficient and orderly spectrum usage
- D. To encourage amateur radio operators to self-regulate and comply with the rules

G2D03 - What procedure may be used by Volunteer Monitors to localize a station whose continuous carrier is holding a repeater on in their area?

- A. Compare vertical and horizontal signal strengths on the input frequency
- B. Compare beam headings on the repeater input from their home locations with that of other Volunteer Monitors
- C. Compare signal strengths between the input and output of the repeater
- D. All these choices are correct

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General License Course

Chapter 3.2

- Amateur Licensing Rules

License Elements

- There are three license exams, which are called elements:
- Element 2 – Technician class (35 multiple-choice questions) - **You've already passed this!**
- Element 3 – General class (35 multiple-choice questions *plus* Element 2)
- Element 4 – Amateur Extra class (50 multiple-choice questions *plus* Elements 2 and 3)
- *There is no longer an Element 1. Morse code was dropped as a licensing requirement.*

Volunteer Examiner Rules

- Must be accredited by a Volunteer Examiner Coordinator*
(Fulton ARC uses W5YI – the other common VEC is the ARRL)
- Must be at least 18 years of age
- Must hold a General class or higher license and be in the FCC database
- Must have never had your amateur license suspended or revoked
- Non-U.S. citizen must hold an FCC-granted General class license or higher
- General class VEs may administer ONLY the Element 2 Technician class exam



*VECs have an agreement to coordinate license exams for the FCC

Examination Rules

- Rules are the same for all exam elements
- Exam session must be coordinated by a VEC with each VE being accredited by that VEC
- Exam session must be conducted by at least three VEs who grade all exams and are responsible for determining the correct answers
- Each successful applicant is given a Certificate of Successful Completion of Examination (CSCE) — good for 365 days — indicating which element(s) the examinee passed



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Identification Requirements

- As soon as you upgrade and receive your CSCE you can start using all of your new (and old) privileges
- Until your upgrade appears in the FCC database, append your call with the identifier (interim AG or /AG) whenever you operate using General Class frequency privileges.
- Communicate in any language but identify in English or standard English language alphabet



License Expiration - Grace Period

- Grace period is 2 years for renewing a lapsed license without re-testing
- Beyond 2 years, a person having held an unrevoked, expired General class or higher license can get a new, equivalent license issued once they show proof of an expired license and pass the Technician class (element 2) license exam to insure they still understand the rules and regulations
- No new Advanced class licenses will be issued
- A new General class license will be issued to expired Generals or Advanced license holders
- A new Extra class license will be issued to expired Extra license holders



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Take Quiz 2



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G1D01 - Who may receive partial credit for the elements represented by an expired amateur radio license?

- A. Any person who can demonstrate that they once held an FCC-issued General, Advanced, or Amateur Extra class license that was not revoked by the FCC
- B. Anyone who held an FCC-issued amateur radio license that expired not less than 5 and not more than 15 years ago
- C. Any person who previously held an amateur license issued by another country, but only if that country has a current reciprocal licensing agreement with the FCC
- D. Only persons who once held an FCC issued Novice, Technician, or Technician Plus license

G1D01 - Who may receive partial credit for the elements represented by an expired amateur radio license?

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- C. Any person who previously held an amateur license issued by another country, but only if that country has a current reciprocal licensing agreement with the FCC
- D. Only persons who once held an FCC issued Novice, Technician, or Technician Plus license

G1D02 - What license examinations may you administer as an accredited Volunteer Examiner holding a General class operator license?

- A. General and Technician
- B. None, only Amateur Extra class licensees may be accredited
- C. Technician only
- D. Amateur Extra, General, and Technician

G1D02 - What license examinations may you administer as an accredited Volunteer Examiner holding a General class operator license?

A. General and Technician

B. None, only Amateur Extra class licensees may be accredited

C. Technician only

D. Amateur Extra, General, and Technician

G1D03 - On which of the following band segments may you operate if you are a Technician class operator and have an unexpired Certificate of Successful Completion of Examination (CSCE) for General class privileges?

- A. Only the Technician band segments until your upgrade is posted in the FCC database
- B. Only on the Technician band segments until you have a receipt for the FCC application fee payment
- C. On any General or Technician class band segment
- D. On any General or Technician class band segment except 30 meters and 60 meters

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D. On any General or Technician class band segment except 30 meters and 60 meters

G1D04 - Who must observe the administration of a Technician class license examination?

- A. At least three Volunteer Examiners of General class or higher
- B. At least two Volunteer Examiners of General class or higher
- C. At least two Volunteer Examiners of Technician class or higher
- D. At least three Volunteer Examiners of Technician class

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A. At least three Volunteer Examiners of General class or higher

B. At least two Volunteer Examiners of General class or higher

C. At least two Volunteer Examiners of Technician class or higher

D. At least three Volunteer Examiners of Technician class

G1D06 - Until an upgrade to General class is shown in the FCC database, when must a Technician licensee identify with "AG" after their call sign?

- A. Whenever they operate using General class frequency privileges
- B. Whenever they operate on any amateur frequency
- C. Whenever they operate using Technician frequency privileges
- D. A special identifier is not required if their General class license application has been filed with the FCC

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G1D07 - Volunteer Examiners are accredited by what organization?

A. The Federal Communications Commission

B. The Universal Licensing System

C. A Volunteer Examiner Coordinator

D. The Wireless Telecommunications Bureau

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D. The Wireless Telecommunications Bureau

G1D08 - Which of the following criteria must be met for a non-US citizen to be an accredited Volunteer Examiner?

- A. The person must be a resident of the US for a minimum of 5 years
- B. The person must hold an FCC granted amateur radio license of General class or above
- C. The person's home citizenship must be in ITU region 2
- D. None of these choices is correct; a non-US citizen cannot be a Volunteer Examiner

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- B. The person must hold an FCC granted amateur radio license of General class or above
- C. The person's home citizenship must be in ITU region 2
- D. None of these choices is correct; a non-US citizen cannot be a Volunteer Examiner

G1D09 - How long is a Certificate of Successful Completion of Examination (CSCE) valid for exam element credit?

- A. 30 days
- B. 180 days
- C. 365 days
- D. For as long as your current license is valid

G1D09 - How long is a Certificate of Successful Completion of Examination (CSCE) valid for exam element credit?

A. 30 days

B. 180 days

C. 365 days

D. For as long as your current license is valid

G1D10 - What is the minimum age that one must be to qualify as an accredited Volunteer Examiner?

- A. 16 years
- B. 18 years
- C. 21 years
- D. There is no age limit

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A. 16 years

B. 18 years

C. 21 years

D. There is no age limit

G1D11 - What action is required to obtain a new General class license after a previously held license has expired and the two-year grace period has passed?

- A. They must have a letter from the FCC showing they once held an amateur or commercial license
- B. There are no requirements other than being able to show a copy of the expired license
- C. Contact the FCC to have the license reinstated
- D. The applicant must show proof of the appropriate expired license grant and pass the current Element 2 exam



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General License Course

Chapter 3.3

- Control Operator Privileges and Rules

But First: Metric Prefixes!

The Metric System Prefixes				
Prefix	Label	Decimal Value	Scientific	Colloquial
yocto	y	0.000 000 000 000 000 000 000 001	10^{-24}	septillionth
zepto	z	0.000 000 000 000 000 000 000 001	10^{-21}	sextillionth
atto	a	0.000 000 000 000 000 000 000 001	10^{-18}	quintillionth
femto	f	0.000 000 000 000 000 000 000 001	10^{-15}	quadrillionth
pico	p	0.000 000 000 001	10^{-12}	trillionth
nano	n	0.000 000 001	10^{-9}	billionth
micro	μ	0.000 001	10^{-6}	millionth
milli	m	0.001	10^{-3}	thousandth
centi	c	0.01	10^{-2}	hundredth
deci	d	0.1	10^{-1}	tenth
---	---	1	10^0	one
deka	da	10	10^1	ten
hecto	h	100	10^2	hundred
kilo	k	1 000	10^3	thousand
mega	M	1 000 000	10^6	million
giga	G	1 000 000 000	10^9	billion
tera	T	1 000 000 000 000	10^{12}	trillion
peta	P	1 000 000 000 000 000	10^{15}	quadrillion
exa	E	1 000 000 000 000 000 000	10^{18}	quintillion
zetta	Z	1 000 000 000 000 000 000 000	10^{21}	sextillion
yotta	Y	1 000 000 000 000 000 000 000 000	10^{24}	septillion



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...and Frequency vs. wavelength...

Frequency Privileges

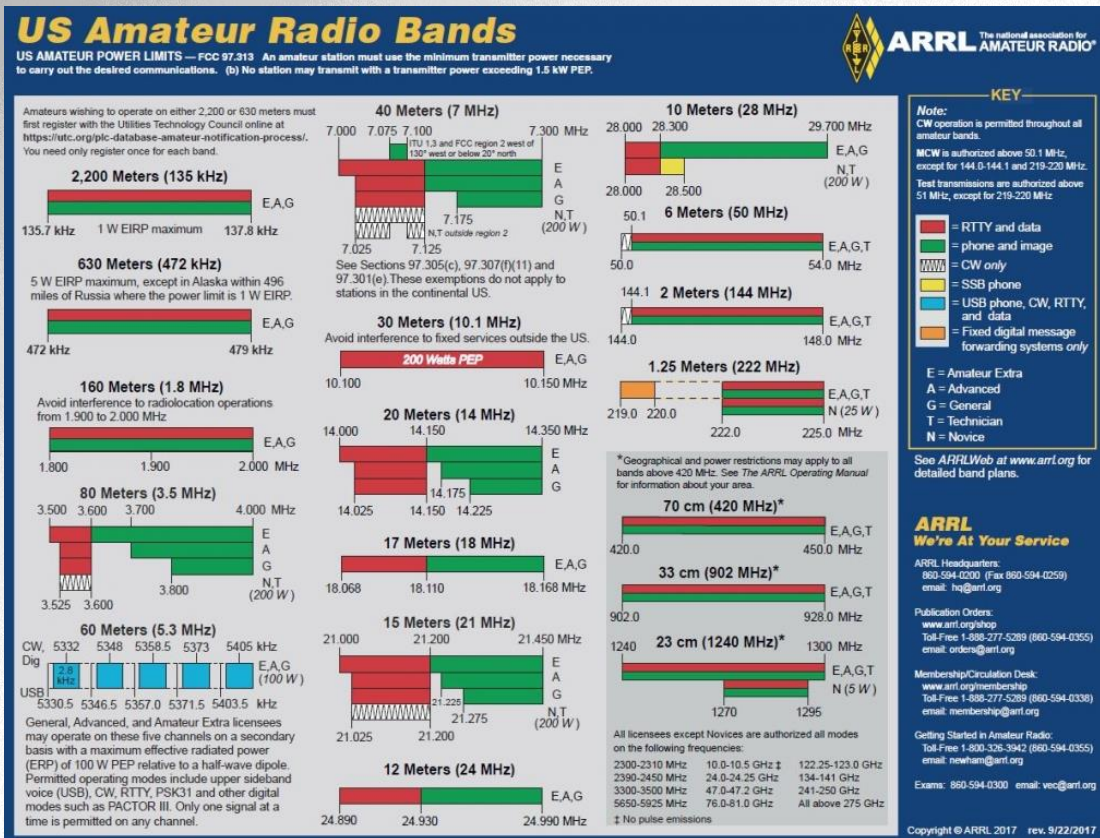
- “Traditional” amateur band frequency sequence: 1.8, 3.5, 7, 14, 21, 28 MHz
- Convert frequency to wavelength: $300/f$ (f = frequency in MHz)
- “Traditional” band wavelengths are therefore: 160, 80/75, 40, 20, 15, and 10 meters (1 meter = 39.37 inches)
- WARC* amateur bands: 60, 30, 17, 12 meters
- General class license operators have some privileges on all bands
- **When General Class licensees are not permitted to use the entire voice portion of a particular band, the permitted frequencies are generally at the upper frequency portion (top end) of the band.**



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*World Administrative Radio Conference

Frequency Privileges



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More Privileges = More Responsibility

Frequency Privileges

- Special notes about the 80, 40, 20 and 15 meter bands:
- There are portions where General class licensees cannot transmit
- There are segments exclusively allocated to Amateur Extra class licensees

Frequency Privileges

- A General Class license holder is granted ALL amateur frequency privileges on the following six HF bands:
- 160 meters
- 60 meters (**5 specific channels, 100w ERP** *referenced to a dipole antenna*)
- 30 meters (**phone/image transmission prohibited, 200w**)
- 17 meters
- 12 meters
- 10 meters

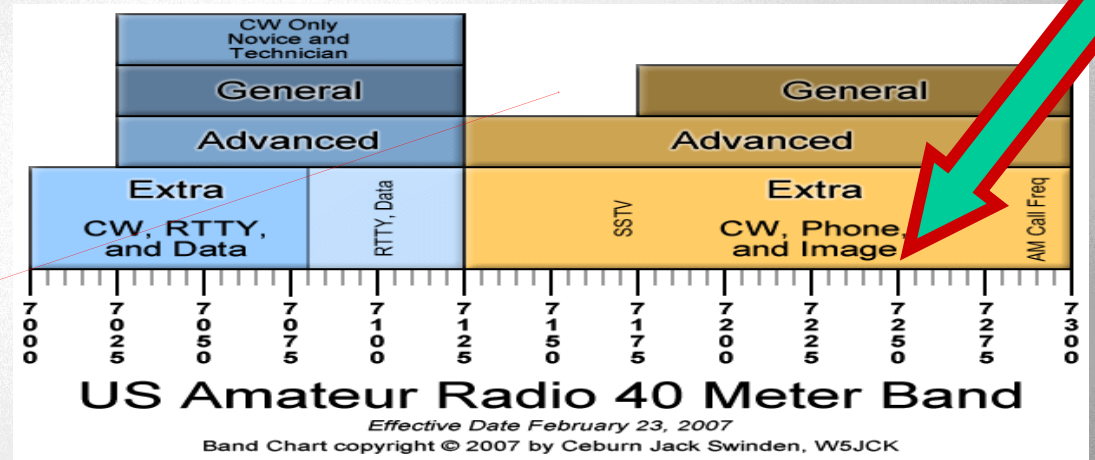


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Commission's Rules

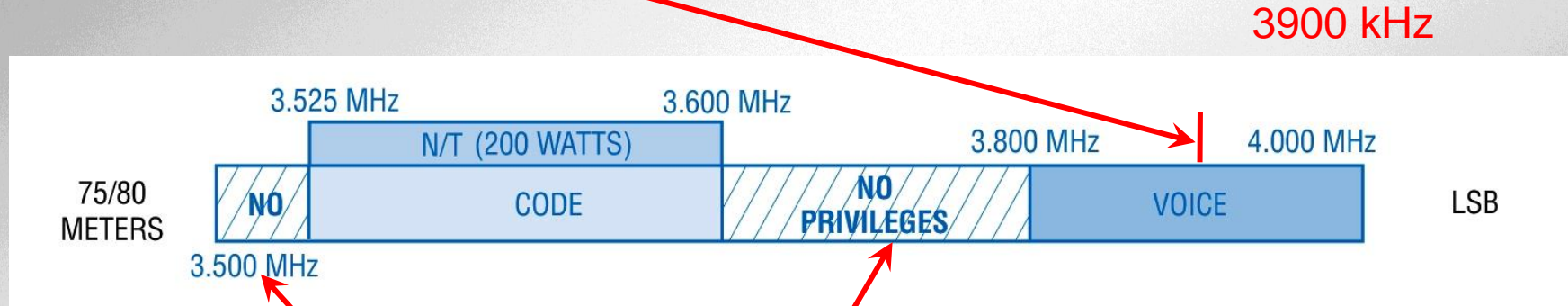
- General class control operator frequency privileges
 - 7.250 MHz is a frequency in the General Class portion of the 40-meter band.

General class licensees are NOT permitted to be control operators outside of their privileges (example: 7.125-7.175 MHz)



Commission's Rules

A frequency of 3,900 kHz is within the General Class portion of the 75 meter band.



Notice areas
where there
are no
privileges for
General Class.

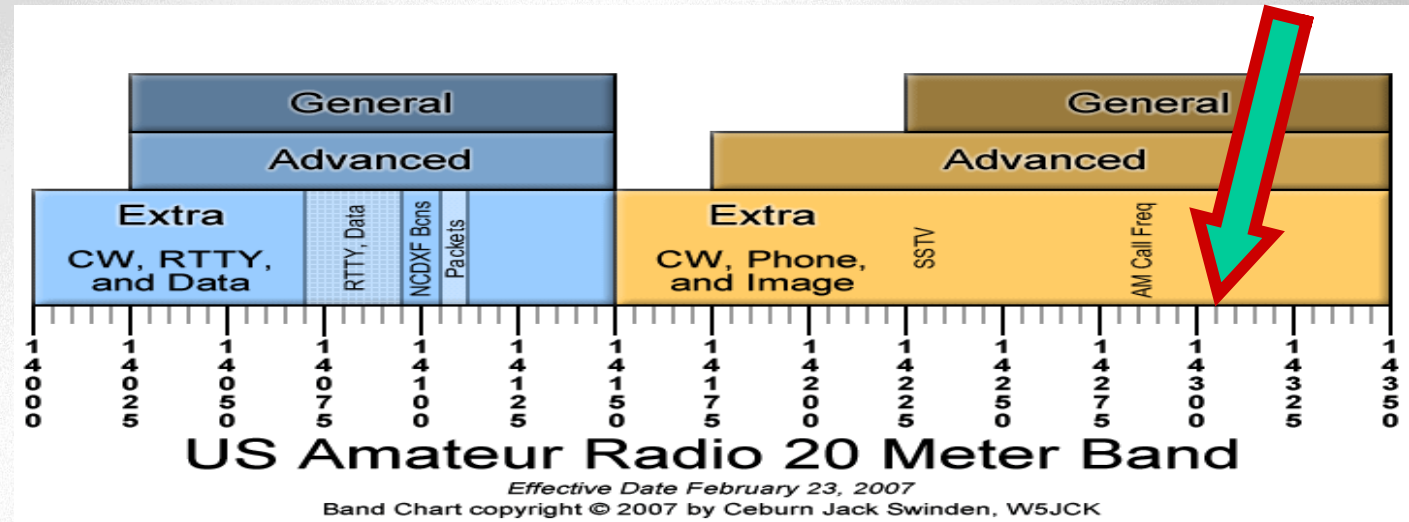
Generally on this band:
phone operation is called 75
meters; CW operation is called
80 meters.



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Commission's Rules

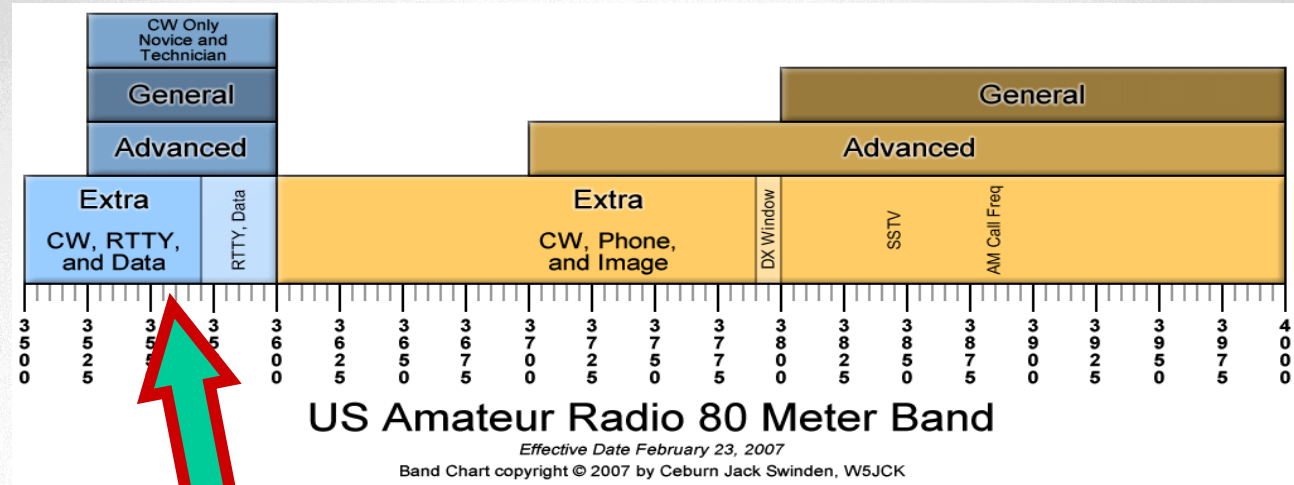
- General class control operator frequency privileges
- 14,305 kHz is a frequency within the General class portion of the 20-meter phone band.



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Commission's Rules

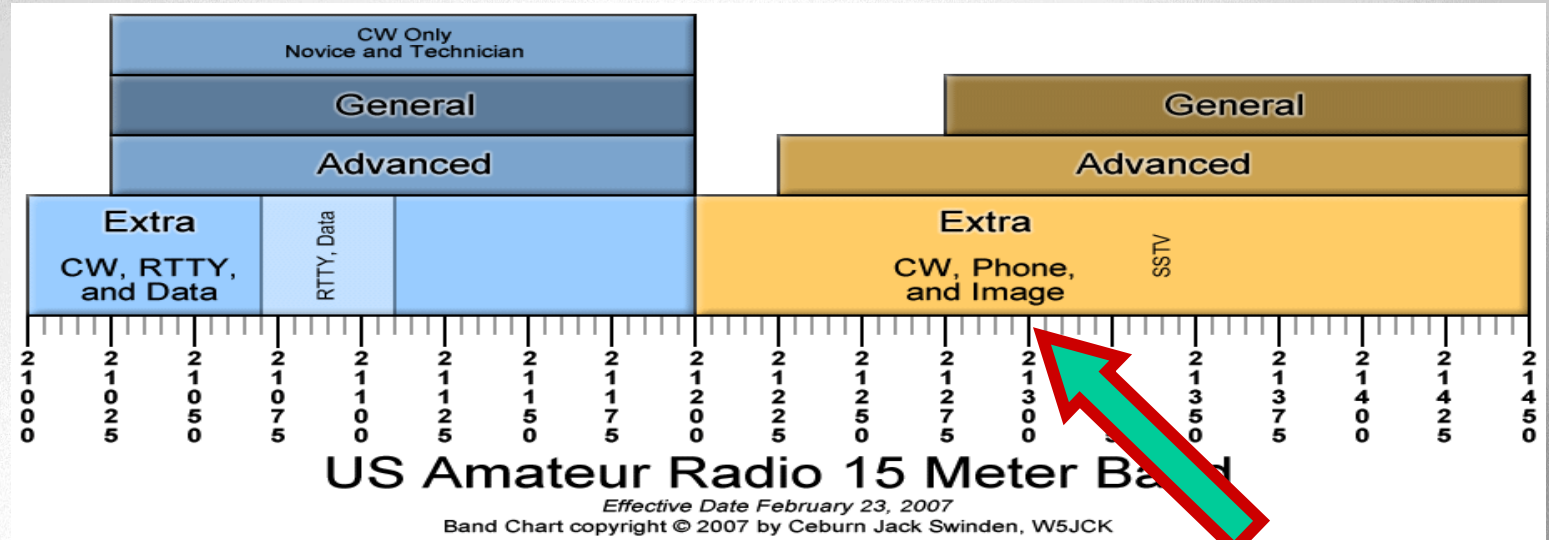
- General class control operator frequency privileges
- 3560 kHz is a frequency within the General class portion of the 80-meter band.



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Commission's Rules

- General class control operator frequency privileges
- 21,300 kHz is a frequency within the General class portion of the 15-meter phone band.



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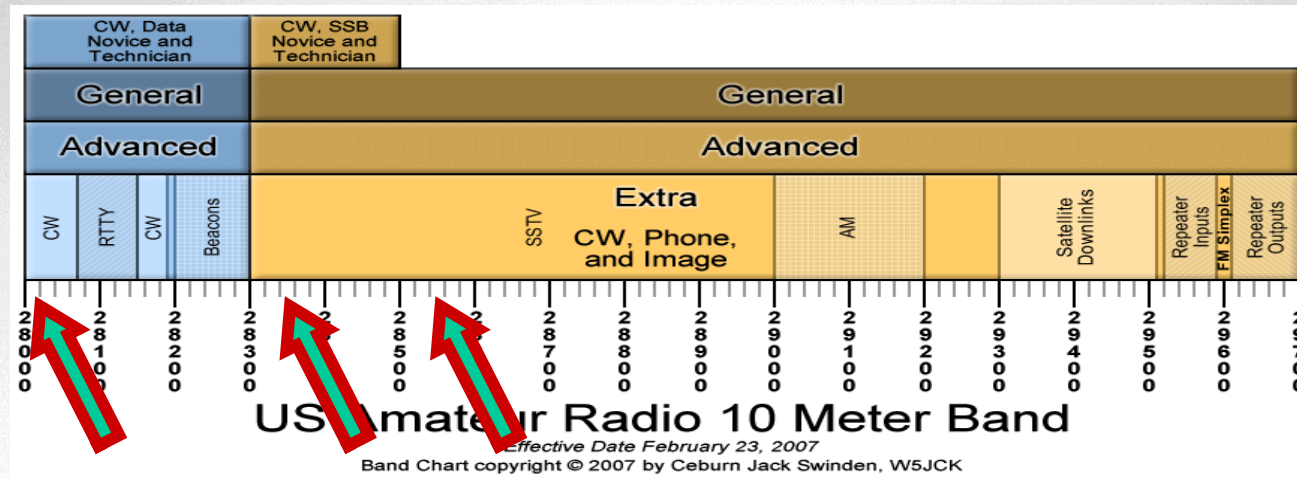
Commission's Rules

- General class control operator frequency privileges
 - ALL 10 meter frequencies are available to a control operator holding a General Class License:

28.020 MHz

28.350 MHz

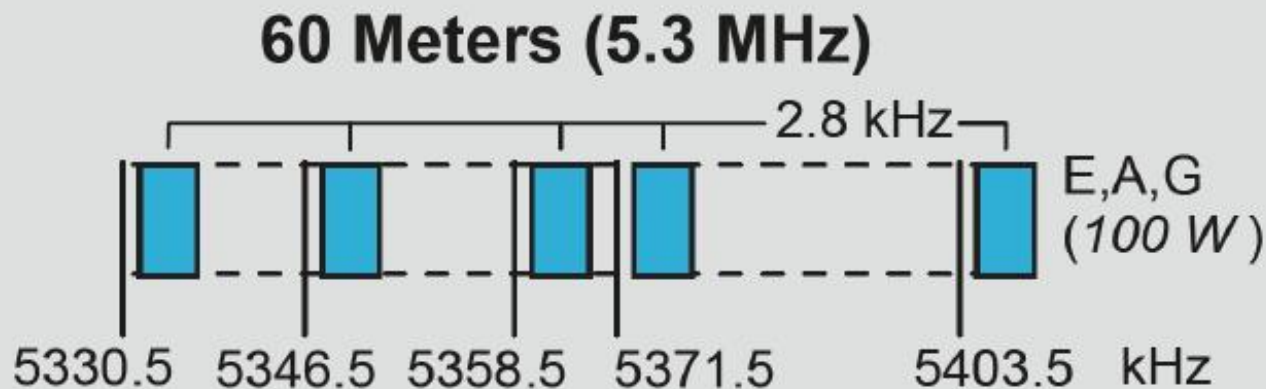
28.550 MHz



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Remember: CW emissions are permitted on ANY
General Class frequency.

60 Meters is Unique...



General, Advanced, and Amateur Extra licensees may use the following five channels on a secondary basis with a maximum effective radiated power of 100 W PEP relative to a half wave dipole. Only upper sideband suppressed carrier voice transmissions, CW, RTTY and data such as PACTOR III. The frequencies are 5330.5, 5346.5, 5358.5, 5371.5 and 5403.5 kHz. The occupied bandwidth is limited to 2.8 kHz centered on 5332, 5348, 5357, 5373, and 5405 kHz respectively.



World Wide Beacon Network



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Picture from the NCDXF: www.ncdxf.org/beacons

Beacons

- Beacons help determine when band openings occur
- Northern California DX Foundation operates and maintains CW beacons on 14.100, 18.110, 21.150, 24.930 and 28.200 MHz (www.ncdxf.org/beacons)
- Use of these frequencies should be avoided

Beacons – Briefly...

- Each beacon transmits CW every three minutes, day and night.

A transmission consists of the callsign of the beacon sent at 22 words per minute followed by four one-second dashes. The callsign and the first dash are sent at 100 watts. The remaining dashes are sent at 10 watts, 1 watt and 100 milliwatts.

The table that follows gives the minute and second of the start of the first transmission within the hour for each beacon on each frequency.

Call	Location	14.100	18.110	21.150	24.930	28.200
4U1UN	United Nations	00:00	00:10	00:20	00:30	00:40
VE8AT	Canada	00:10	00:20	00:30	00:40	00:50
W6WX	United States	00:20	00:30	00:40	00:50	01:00
KH6WO	Hawaii	00:30	00:40	00:50	01:00	01:10
ZL6B	New Zealand	00:40	00:50	01:00	01:10	01:20
VK6RBP	Australia	00:50	01:00	01:10	01:20	01:30
JA2IGY	Japan	01:00	01:10	01:20	01:30	01:40
RR9O	Russia	01:10	01:20	01:30	01:40	01:50
VR2B	Hong Kong	01:20	01:30	01:40	01:50	02:00
4S7B	Sri Lanka	01:30	01:40	01:50	02:00	02:10
ZS6DN	South Africa	01:40	01:50	02:00	02:10	02:20
5Z4B	Kenya	01:50	02:00	02:10	02:20	02:30
4X6TU	Israel	02:00	02:10	02:20	02:30	02:40
OH2B	Finland	02:10	02:20	02:30	02:40	02:50
CS3B	Madeira	02:20	02:30	02:40	02:50	00:00
LU4AA	Argentina	02:30	02:40	02:50	00:00	00:10
OA4B	Peru	02:40	02:50	00:00	00:10	00:20
YV5B	Venezuela	02:50	00:00	00:10	00:20	00:30



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[C:\Users\ai2n\Videos\General Course -
Videos\4X6TU 15m Beacon.wmv](C:\Users\ai2n\Videos\General Course - Videos\4X6TU 15m Beacon.wmv)



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4X6TU Beacon – 15 meters

Beacons

- Beacons are used for observation of propagation and reception to various parts of the world (*as identified in FCC rules*)
- No more than one beacon signal in the same band from a single location is permitted
- Beacons are limited to 100 W PEP
- 28.2 to 28.3 MHz is the only HF band segment where automatically controlled beacons may operate



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Repeater Coordination

- Volunteer Repeater or Frequency Coordinators are established to minimize repeater-to-repeater interference
- Regional Coordinators work with local amateurs to assign input and output frequencies to minimize interference
- HF Repeater operation is limited to the 10 meter band above 29.5 MHz



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Commission's Rules - Interference

- Conditions that require an Amateur Radio station to take specific steps to avoid harmful interference to other users or facilities
 - When operating within one mile of an FCC Monitoring Station
 - When using a band where the Amateur Service is secondary
 - When a station is transmitting spread spectrum emissions
 - **All of these choices are correct**
- In the event of interference between a coordinated repeater and an uncoordinated repeater, the licensee of the *non-coordinated* repeater has primary responsibility to resolve the interference.

Primary vs. Secondary

- Amateurs have primary status on most bands
- Exceptions: On 60 meters, 30 meters, and 70 cm amateurs have secondary status
- When operating on a secondary allocated band, listen carefully to prevent interference to the primary service
- If necessary, change frequency or stop transmitting to avoid interference - you are not protected from interference by primary users



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WiFi Considerations

- Amateur Radio shares spectrum with unlicensed Wi-fi devices in the 13 cm (2.4 GHz) band
- Amateurs may use some Wi-Fi protocols on this band but communicating with non-licensed Wi-Fi stations/routers is prohibited



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Take Quiz 3



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G1A01 - On which HF and/or MF amateur bands are there portions where General class licensees cannot transmit?

- A. 60 meters, 30 meters, 17 meters, and 12 meters
- B. 160 meters, 60 meters, 15 meters, and 12 meters
- C. 80 meters, 40 meters, 20 meters, and 15 meters
- D. 80 meters, 20 meters, 15 meters, and 10 meters

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- B. 160 meters, 60 meters, 15 meters, and 12 meters
- C. 80 meters, 40 meters, 20 meters, and 15 meters
- D. 80 meters, 20 meters, 15 meters, and 10 meters

G1A02 - On which of the following bands is phone operation prohibited?

- A. 160 meters
- B. 30 meters
- C. 17 meters
- D. 12 meters

G1A02 - On which of the following bands is phone operation prohibited?

A. 160 meters

B. 30 meters

C. 17 meters

D. 12 meters

G1A03 - On which of the following bands is image transmission prohibited?

A. 160 meters

B. 30 meters

C. 20 meters

D. 12 meters

G1A03 - On which of the following bands is image transmission prohibited?

A. 160 meters

B. 30 meters

C. 20 meters

D. 12 meters

G1A04 - Which of the following amateur bands is restricted to communication only on specific channels, rather than frequency ranges?

- A. 11 meters
- B. 12 meters
- C. 30 meters
- D. 60 meters

G1A04 - Which of the following amateur bands is restricted to communication only on specific channels, rather than frequency ranges?

A. 11 meters

B. 12 meters

C. 30 meters

D. 60 meters



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G1A05 - On which of the following frequencies are General class licensees prohibited from operating as control operator?

- A. 7.125 MHz to 7.175 MHz
- B. 28.000 MHz to 28.025 MHz
- C. 21.275 MHz to 21.300 MHz
- D. All of the above

G1A05 - On which of the following frequencies are General class licensees prohibited from operating as control operator?

A. 7.125 MHz to 7.175 MHz

B. 28.000 MHz to 28.025 MHz

C. 21.275 MHz to 21.300 MHz

D. All of the above

G1A06 - Which of the following applies when the FCC rules designate the amateur service as a secondary user on a band?

- A. Amateur stations must record the call sign of the primary service station before operating on a frequency assigned to that station
- B. Amateur stations may use the band only during emergencies
- C. Amateur stations must not cause harmful interference to primary users and must accept interference from primary users
- D. Amateur stations may only operate during specific hours of the day, while primary users are permitted 24-hour use of the band

G1A06 - Which of the following applies when the FCC rules designate the amateur service as a secondary user on a band?

- A. Amateur stations must record the call sign of the primary service station before operating on a frequency assigned to that station
- B. Amateur stations may use the band only during emergencies
- C. Amateur stations must not cause harmful interference to primary users and must accept interference from primary users
- D. Amateur stations may only operate during specific hours of the day, while primary users are permitted 24-hour use of the band

G1A07 - On which amateur frequencies in the 10-meter band may stations with a General class control operator transmit CW emissions?

A. 28.000 MHz to 28.025 MHz only

B. 28.000 MHz to 28.300 MHz only

C. 28.025 MHz to 28.300 MHz only

D. The entire band

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B. 28.000 MHz to 28.300 MHz only

C. 28.025 MHz to 28.300 MHz only

D. The entire band

G1A08 - Which HF bands have segments exclusively allocated to Amateur Extra licensees?

- A. All HF bands
- B. 80 meters, 40 meters, 20 meters, and 15 meters
- C. All HF bands except 160 meters and 10 meters
- D. 60 meters, 30 meters, 17 meters, and 12 meters

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A. All HF bands

B. 80 meters, 40 meters, 20 meters, and 15 meters

C. All HF bands except 160 meters and 10 meters

D. 60 meters, 30 meters, 17 meters, and 12 meters

G1A09 - Which of the following frequencies is within the General class portion of the 15-meter band?

A. 14250 kHz

B. 18155 kHz

C. 21300 kHz

D. 24900 kHz

G1A09 - Which of the following frequencies is within the General class portion of the 15-meter band?

A. 14250 kHz

B. 18155 kHz

C. 21300 kHz

D. 24900 kHz

G1A10 - What portion of the 10-meter band is available for repeater use?

- A. The entire band
- B. The portion between 28.1 MHz and 28.2 MHz
- C. The portion between 28.3 MHz and 28.5 MHz
- D. The portion above 29.5 MHz

G1A10 - What portion of the 10-meter band is available for repeater use?

- A. The entire band
- B. The portion between 28.1 MHz and 28.2 MHz
- C. The portion between 28.3 MHz and 28.5 MHz
- D. The portion above 29.5 MHz

G1A11 - When General class licensees are not permitted to use the entire voice portion of a band, which portion of the voice segment is available to them?

A. The lower frequency portion

B. The upper frequency portion

C. The lower frequency portion on frequencies below 7.3 MHz, and the upper portion on frequencies above 14.150 MHz

D. The upper frequency portion on frequencies below 7.3 MHz, and the lower portion on frequencies above 14.150 MHz



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G1A11 - When General class licensees are not permitted to use the entire voice portion of a band, which portion of the voice segment is available to them?

A. The lower frequency portion

B. The upper frequency portion

C. The lower frequency portion on frequencies below 7.3 MHz, and the upper portion on frequencies above 14.150 MHz

D. The upper frequency portion on frequencies below 7.3 MHz, and the lower portion on frequencies above 14.150 MHz

G1B02 - With which of the following conditions must beacon stations comply?

- A. No more than one beacon station may transmit in the same band from the same station location
- B. The frequency must be coordinated with the National Beacon Organization
- C. The frequency must be posted on the internet or published in a national periodical
- D. All these choices are correct

G1B02 - With which of the following conditions must beacon stations comply?

A. No more than one beacon station may transmit in the same band from the same station location

B. The frequency must be coordinated with the National Beacon Organization

C. The frequency must be posted on the internet or published in a national periodical

D. All these choices are correct



G1B03 - Which of the following is a purpose of a beacon station as identified in the FCC rules?

- A. Observation of propagation and reception
- B. Automatic identification of repeaters
- C. Transmission of bulletins of general interest to amateur radio licensees
- D. All these choices are correct

G1B03 - Which of the following is a purpose of a beacon station as identified in the FCC rules?

A. Observation of propagation and reception

B. Automatic identification of repeaters

C. Transmission of bulletins of general interest to amateur radio licensees

D. All these choices are correct

G1B09 - On what HF frequencies are automatically controlled beacons permitted?

- A. On any frequency if power is less than 1 watt
- B. On any frequency if transmissions are in Morse code
- C. 21.08 MHz to 21.09 MHz
- D. 28.20 MHz to 28.30 MHz

G1B09 - On what HF frequencies are automatically controlled beacons permitted?

- A. On any frequency if power is less than 1 watt
- B. On any frequency if transmissions are in Morse code
- C. 21.08 MHz to 21.09 MHz
- D. 28.20 MHz to 28.30 MHz

G1B10 - What is the power limit for beacon stations?

- A. 10 watts PEP output
- B. 20 watts PEP output
- C. 100 watts PEP output
- D. 200 watts PEP output

G1B10 - What is the power limit for beacon stations?

A. 10 watts PEP output

B. 20 watts PEP output

C. 100 watts PEP output

D. 200 watts PEP output



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G1E04 - Which of the following conditions require a licensed amateur radio operator to take specific steps to avoid harmful interference to other users or facilities?

- A. When operating within one mile of an FCC Monitoring Station
- B. When using a band where the Amateur Service is secondary
- C. When a station is transmitting spread spectrum emissions
- D. All these choices are correct

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- A. When operating within one mile of an FCC Monitoring Station
- B. When using a band where the Amateur Service is secondary
- C. When a station is transmitting spread spectrum emissions
- D. All these choices are correct

G1E07 - In what part of the 2.4 GHz band may an amateur station communicate with non-licensed Wi-Fi stations?

- A. Anywhere in the band
- B. Channels 1 through 4
- C. Channels 42 through 45
- D. No part

G1E07 - In what part of the 2.4 GHz band may an amateur station communicate with non-licensed Wi-Fi stations?

- A. Anywhere in the band
- B. Channels 1 through 4
- C. Channels 42 through 45
- D. No part

G1E10 - Why should an amateur operator normally avoid transmitting on 14.100, 18.110, 21.150, 24.930 and 28.200 MHz?

- A. A system of propagation beacon stations operates on those frequencies
- B. A system of automatic digital stations operates on those frequencies
- C. These frequencies are set aside for emergency operations
- D. These frequencies are set aside for bulletins from the FCC

G1E10 - Why should an amateur operator normally avoid transmitting on 14.100, 18.110, 21.150, 24.930 and 28.200 MHz?

A. A system of propagation beacon stations operates on those frequencies

B. A system of automatic digital stations operates on those frequencies

C. These frequencies are set aside for emergency operations

D. These frequencies are set aside for bulletins from the FCC

G8C01 - On what band do amateurs share channels with the unlicensed Wi-Fi service?

A. 432 MHz

B. 902 MHz

C. 2.4 GHz

D. 10.7 GHz

G8C01 - On what band do amateurs share channels with the unlicensed Wi-Fi service?

A. 432 MHz

B. 902 MHz

C. 2.4 GHz

D. 10.7 GHz

General License Course

Chapter 3.3

- Third Party, Prohibited, and
- Restricted Communications

Permitted Transmissions

- Occasional retransmission of weather and propagation forecasts from U.S. Government stations
- One-Way transmissions to assist learning the International Morse Code



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Third Party Traffic Agreements List



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Table 3.3

Third-Party Traffic Agreements List

Occasionally, DX stations may ask you to pass a third-party message to a friend or relative in the States. This is all right as long as the US has signed an official third-party traffic agreement with that particular country, or the third party is a licensed amateur. The traffic must be noncommercial and of a personal, unimportant nature. During an emergency, the US State Department will often work out a special temporary agreement with the country involved. But in normal times, never handle traffic without first making sure it is legally permitted.

US amateurs may handle third-party traffic with:

V2	Antigua/Barbuda	C5	Gambia, The	OA-OC	Peru
LO-LW	Argentina	9G	Ghana	DU-DZ	Philippines
VK	Australia	J3	Grenada	VR6	Pitcairn Island*
V3	Belize	TG	Guatemala	V4	St. Kitts/Nevis
CP	Bolivia	8R	Guyana	J6	St. Lucia
E7	Bosnia-Herzegovina	HH	Haiti	J8	St. Vincent and the Grenadines
PP-PY	Brazil	HQ-HR	Honduras	9L	Sierra Leone
VE, VO, VY	Canada	4X, 4Z	Israel	ZR-ZU	South Africa
CA-CE	Chile	6Y	Jamaica	3DA	Swaziland
HJ-HK	Colombia	JY	Jordan	9Y-9Z	Trinidad/Tobago
D6	Comoros (Federal Islamic Republic of)	EL	Liberia	TA-TC	Turkey
TI, TE	Costa Rica	V7	Marshall Islands	GB	United Kingdom
CM, CO	Cuba	XA-XI	Mexico	CV-CX	Uruguay
HI	Dominican Republic	V6	Micronesia, Federated States of	YV-YY	Venezuela
J7	Dominica	YN	Nicaragua	4U1ITU	ITU - Geneva
HC-HD	Ecuador	HO-HP	Panama	4U1VIC	VIC - Vienna
YS	El Salvador	ZP	Paraguay		

Notes:

Since 1970, there has been an informal agreement between the United Kingdom and the US, permitting Pitcairn and US amateurs to exchange messages concerning medical emergencies, urgent need for equipment or supplies, and private or personal matters of island residents.

Please note that Region 2 of the International Amateur Radio Union (IARU) has recommended that international traffic on the 20 and 15 meter bands be conducted on 14.100 – 14.150, 14.250 – 14.350, 21.150 – 21.200, and 21.300 – 21.450 MHz. The IARU is the alliance of Amateur Radio societies from around the world; Region 2 comprises member-societies in North, South, and Central America and the Caribbean.

At the end of an exchange of third-party traffic with a station located in a foreign country, an FCC-licensed amateur must transmit the call sign of the foreign station as well as his own call sign.

Current as of February 2023; see arrl.org/third-party-operating-agreements for the latest information.

Prohibited & Restricted Communications

- Music - except as part of manned space craft retransmissions
- Transmissions of codes designed to obscure/hide the meaning of the message
- *Exceptions: controlling a space satellite or radio-controlled model craft*
- Transmitting false distress signals
- Abbreviations or procedural signals are acceptable if they don't obscure the meaning of the message



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Prohibited & Restricted Communications

- Business-related or pecuniary (monetary) interests in communications activity. Exception: When other amateurs are being notified of the sale of apparatus normally used in an amateur station and such activity is not done on a regular basis (swap nets, etc.)
- Amateur stations may communicate with amateurs in other countries *except* amateurs in countries whose administrations have notified the ITU that they object to such communications.



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Prohibited & Restricted Communications

Restriction: A 10m to 2m cross-band repeater may only retransmit a 2m signal from a Technician class operator if the 10m control operator holds at least a General class license



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Third-party communication - sending messages on behalf of someone who is not an amateur or allowing someone to speak on the radio who is not an amateur

If the third party was an amateur licensee whose license has been revoked and not reinstated he/she may NOT send a third-party message

Third-party communications may be exchanged between any two amateur stations with the constraint that the *communications must be noncommercial and of a personal, unimportant nature or must be related to emergencies or disaster relief.*

U.S. amateurs may conduct third-party amateur radio communication outside the U.S. *ONLY if the country has a third-party agreement with the U.S.*



EXCEPTION – Messages directly involving emergencies or disaster relief

Third-Party Communications

- Third-Party messages may be transmitted via remote control under any circumstances in which third-party messages are permitted by FCC rules



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Take Quiz 4



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G1E01 - Which of the following would disqualify a third party from participating in sending a message via an amateur station?

- A. The third party's amateur license has been revoked and not reinstated
- B. The third party is not a US citizen
- C. The third party is speaking in a language other than English
- D. All these choices are correct

G1E01 - Which of the following would disqualify a third party from participating in sending a message via an amateur station?

A. The third party's amateur license has been revoked and not reinstated

B. The third party is not a US citizen

C. The third party is speaking in a language other than English

D. All these choices are correct

G1E05 - What are the restrictions on messages sent to a third party in a country with which there is a Third-Party Agreement?

- A. They must relate to emergencies or disaster relief
- B. They must be for other licensed amateurs
- C. They must relate to amateur radio, or remarks of a personal character, or messages relating to emergencies or disaster relief
- D. The message must be limited to no longer than 1 minute in duration and the name of the third party must be recorded in the station log

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D. The message must be limited to no longer than 1 minute in duration and the name of the third party must be recorded in the station log

G1E12 - When may third-party messages be transmitted via remote control?

- A. Under any circumstances in which third party messages are permitted by FCC rules
- B. Under no circumstances except for emergencies
- C. Only when the message is intended for licensed radio amateurs
- D. Only when the message is intended for third parties in areas where licensing is controlled by the FCC

G1E12 - When may third-party messages be transmitted via remote control?

- A. Under any circumstances in which third party messages are permitted by FCC rules
- B. Under no circumstances except for emergencies
- C. Only when the message is intended for licensed radio amateurs
- D. Only when the message is intended for third parties in areas where licensing is controlled by the FCC

G1B04 - Which of the following transmissions is permitted for all amateur stations?

- A. Unidentified transmissions of less than 10 seconds duration for test purposes only
- B. Automatic retransmission of other amateur signals by any amateur station
- C. Occasional retransmission of weather and propagation forecast information from US government stations
- D. Encrypted messages, if not intended to facilitate a criminal act



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D. Encrypted messages, if not intended to facilitate a criminal act



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G1B05 - Which of the following one-way transmissions are permitted?

- A. Unidentified test transmissions of less than 10 seconds in duration
- B. Transmissions to assist with learning the International Morse code
- C. Regular transmissions offering equipment for sale, if intended for amateur radio use
- D. All these choices are correct

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A. Unidentified test transmissions of less than 10 seconds in duration

B. Transmissions to assist with learning the International Morse code

C. Regular transmissions offering equipment for sale, if intended for amateur radio use

D. All these choices are correct

G1B07 - What are the restrictions on the use of abbreviations or procedural signals in the amateur service?

- A. Only "Q" signals are permitted
- B. They may be used if they do not obscure the meaning of a message
- C. They are not permitted
- D. They are limited to those expressly listed in Part 97 of the FCC rules

G1B07 - What are the restrictions on the use of abbreviations or procedural signals in the amateur service?

A. Only "Q" signals are permitted

B. They may be used if they do not obscure the meaning of a message

C. They are not permitted

D. They are limited to those expressly listed in Part 97 of the FCC rules

G1B08 - When is it permissible to communicate with amateur stations in countries outside the areas administered by the Federal Communications Commission?

- A. Only when the foreign country has a formal third-party agreement filed with the FCC
- B. When the contact is with amateurs in any country except those whose administrations have notified the ITU that they object to such communications
- C. Only when the contact is with amateurs licensed by a country which is a member of the United Nations, or by a territory possessed by such a country
- D. Only when the contact is with amateurs licensed by a country which is a member of the International Amateur Radio Union, or by a territory possessed by such a country

G1B08 - When is it permissible to communicate with amateur stations in countries outside the areas administered by the Federal Communications Commission?

A. Only when the foreign country has a formal third-party agreement filed with the FCC

B. When the contact is with amateurs in any country except those whose administrations have notified the ITU that they object to such communications

C. Only when the contact is with amateurs licensed by a country which is a member of the United Nations, or by a territory possessed by such a country

D. Only when the contact is with amateurs licensed by a country which is a member of the International Amateur Radio Union, or by a territory possessed by such a country

G1E02 - When may a 10-meter repeater retransmit the 2-meter signal from a station that has a Technician class control operator?

- A. Under no circumstances
- B. Only if the station on 10-meters is operating under a Special Temporary Authorization allowing such retransmission
- C. Only during an FCC-declared general state of communications emergency
- D. Only if the 10-meter repeater control operator holds at least a General class license



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G1E02 - When may a 10-meter repeater retransmit the 2-meter signal from a station that has a Technician class control operator?

- A. Under no circumstances
- B. Only if the station on 10-meters is operating under a Special Temporary Authorization allowing such retransmission
- C. Only during an FCC-declared general state of communications emergency
- D. Only if the 10-meter repeater control operator holds at least a General class license



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General License Course

Chapter 3.4

- Technical Rules and Standards

Good Amateur Practices

- The general requirement by the FCC, in the *absence of a specific rule*, is that Amateur stations be operated in *conformance with good engineering and good amateur practices*
- The **FCC** determines what good engineering or amateur practices are.
- Allows a little wiggle room for experimentation



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Transmitters & Power

- FCC Rules dictate that Peak Envelope Power (PEP, in watts) will be used to describe/regulate maximum transmitter output power.
- PEP will be described in more detail in a future lesson.

Transmitters & Power

- General, Advanced and Amateur Extra operators are limited to a maximum transmitter *output* of 1500 W PEP - *exceptions:*
 - Amateurs are restricted to 200 W PEP on the 30m band
 - Amateurs are restricted to an ERP* of 100 watts PEP on 60m with a maximum bandwidth of 2.8 kHz
- Amateurs are, at all times, required to use *the minimum power necessary to carry out the desired communication*



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*Effective Radiated Power (ERP) takes
power output, feedline loss, antenna
gain - 100 W ERP assumes use of a
dipole (0 dBd)

Transmitters & Power

- *QRP* – low power transmit operation. Usually 10 W output power or less; 5 W is common. (Raise your power is QRO)
- Some hams use even less power
- Popular for portable operating
- Novices and Techs are limited to 200 W PEP on HF
- Spread Spectrum transmissions are limited to 10 W PEP



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Commission's Rules – Digital Modes

- ~~• Baud - a unit of transmission speed equal to the number of times a signal changes state per second. Higher Baud rate = wider bandwidth~~
- ~~• 300 baud is the maximum symbol rate permitted for RTTY or data emission transmission on the 20 meter band.~~
- ~~• 300 baud is the maximum symbol rate permitted for RTTY or data emission transmitted at frequencies below 28 MHz.~~
- ~~• 1200 baud is the maximum symbol rate permitted for RTTY or data emission transmissions on the 10 meter band.~~
- ~~• 19.6 kilobaud is the maximum symbol rate permitted for RTTY or data emission transmissions on the 2 meter band.~~
- ~~• 56 kilobaud is the maximum symbol rate permitted for RTTY or data emission transmitted on the 1.25 meter and 70 centimeter bands.~~



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**THESE CHANGED! The FCC moved to
bandwidth limits vs. data rate limits!**

New Digital Protocols

- New Digital Protocols are cropping up on a regular basis
- Before using a new digital protocol LIVE on the air the FCC requires that the technical characteristics of the protocol be publicly documented

That can be as simple as publishing the protocols on a web page or in a magazine

Take Quiz 5



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G1B11 - Who or what determines "good engineering and good amateur practice," as applied to the operation of an amateur station in all respects not covered by the Part 97 rules?

- A. The FCC
- B. The control operator
- C. The IEEE
- D. The ITU

G1B11 - Who or what determines "good engineering and good amateur practice," as applied to the operation of an amateur station in all respects not covered by the Part 97 rules?

A. The FCC

B. The control operator

C. The IEEE

D. The ITU

G1C01 - What is the maximum transmitter power an amateur station may use on 10.140 MHz?

- A. 200 watts PEP output
- B. 1000 watts PEP output
- C. 1500 watts PEP output
- D. 2000 watts PEP output



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G1C01 - What is the maximum transmitter power an amateur station may use on 10.140 MHz?

- A. 200 watts PEP output
- B. 1000 watts PEP output
- C. 1500 watts PEP output
- D. 2000 watts PEP output



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G1C02 - What is the maximum transmitter power an amateur station may use on the 12-meter band?

A. 50 watts PEP output

B. 200 watts PEP output

C. 1500 watts PEP output

D. An effective radiated power equivalent to 100 watts from a half-wave dipole



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G1C02 - What is the maximum transmitter power an amateur station may use on the 12-meter band?

A. 50 watts PEP output

B. 200 watts PEP output

C. 1500 watts PEP output

D. An effective radiated power equivalent to 100 watts from a half-wave dipole



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G1C03 - What is the maximum bandwidth permitted by FCC rules for amateur radio stations transmitting on USB frequencies in the 60-meter band?

A. 2.8 kHz

B. 5.6 kHz

C. 1.8 kHz

D. 3 kHz

G1C03 - What is the maximum bandwidth permitted by FCC rules for amateur radio stations transmitting on USB frequencies in the 60-meter band?

A. 2.8 kHz

B. 5.6 kHz

C. 1.8 kHz

D. 3 kHz

G1C05 - What is the limit for transmitter power on the 28 MHz band for a General Class control operator?

- A. 100 watts PEP output
- B. 1000 watts PEP output
- C. 1500 watts PEP output
- D. 2000 watts PEP output

G1C05 - What is the limit for transmitter power on the 28 MHz band for a General Class control operator?

- A. 100 watts PEP output
- B. 1000 watts PEP output
- C. 1500 watts PEP output
- D. 2000 watts PEP output



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G1C06 - What is the limit for transmitter power on the 1.8 MHz band?

- A. 200 watts PEP output
- B. 1000 watts PEP output
- C. 1200 watts PEP output
- D. 1500 watts PEP output



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G1C06 - What is the limit for transmitter power on the 1.8 MHz band?

- A. 200 watts PEP output
- B. 1000 watts PEP output
- C. 1200 watts PEP output
- D. 1500 watts PEP output

G1C09 - What is the maximum power limit on the 60-meter band?

A. 1500 watts PEP

B. 10 watts RMS

C. ERP of 100 watts PEP with respect to a dipole

D. ERP of 100 watts PEP with respect to an isotropic antenna

G1C09 - What is the maximum power limit on the 60-meter band?

A. 1500 watts PEP

B. 10 watts RMS

C. ERP of 100 watts PEP with respect to a dipole

D. ERP of 100 watts PEP with respect to an isotropic antenna

G1C11 - What measurement is specified by FCC rules that regulate maximum power?

- A. RMS output from the transmitter
- B. RMS input to the antenna
- C. PEP input to the antenna
- D. PEP output from the transmitter

G1C11 - What measurement is specified by FCC rules that regulate maximum power?

A. RMS output from the transmitter

B. RMS input to the antenna

C. PEP input to the antenna

D. PEP output from the transmitter

G1E08 - What is the maximum PEP output allowed for spread spectrum transmissions?

A. 100 milliwatts

B. 10 watts

C. 100 watts

D. 1500 watts

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- B. Low-power transmit operation
- C. Transmission using Quick Response Protocol
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Next Week – Chapters 4.1 to 4.3

*Review Metric Prefixes (Kilo, micro, etc...)
and bring your calculators*



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