

# **The Glendora and Hacienda Height's Stakes of the Church of Jesus Christ of Latter-day Saints**

*Presents*

# ***Technician License Class 2009***

**March 20 & 21, 2009  
Oakbank Building  
Glendora, California**

# The Glendora Emergency Response Communications Radio Operators

Welcome You to Class!



## **Instructors:**

**Jim Dowdle, KG6TQT**

**Frank Bigelow, KG6TQV**

**Jim Burton, KG6VBM**

## **Class Coordinator:**

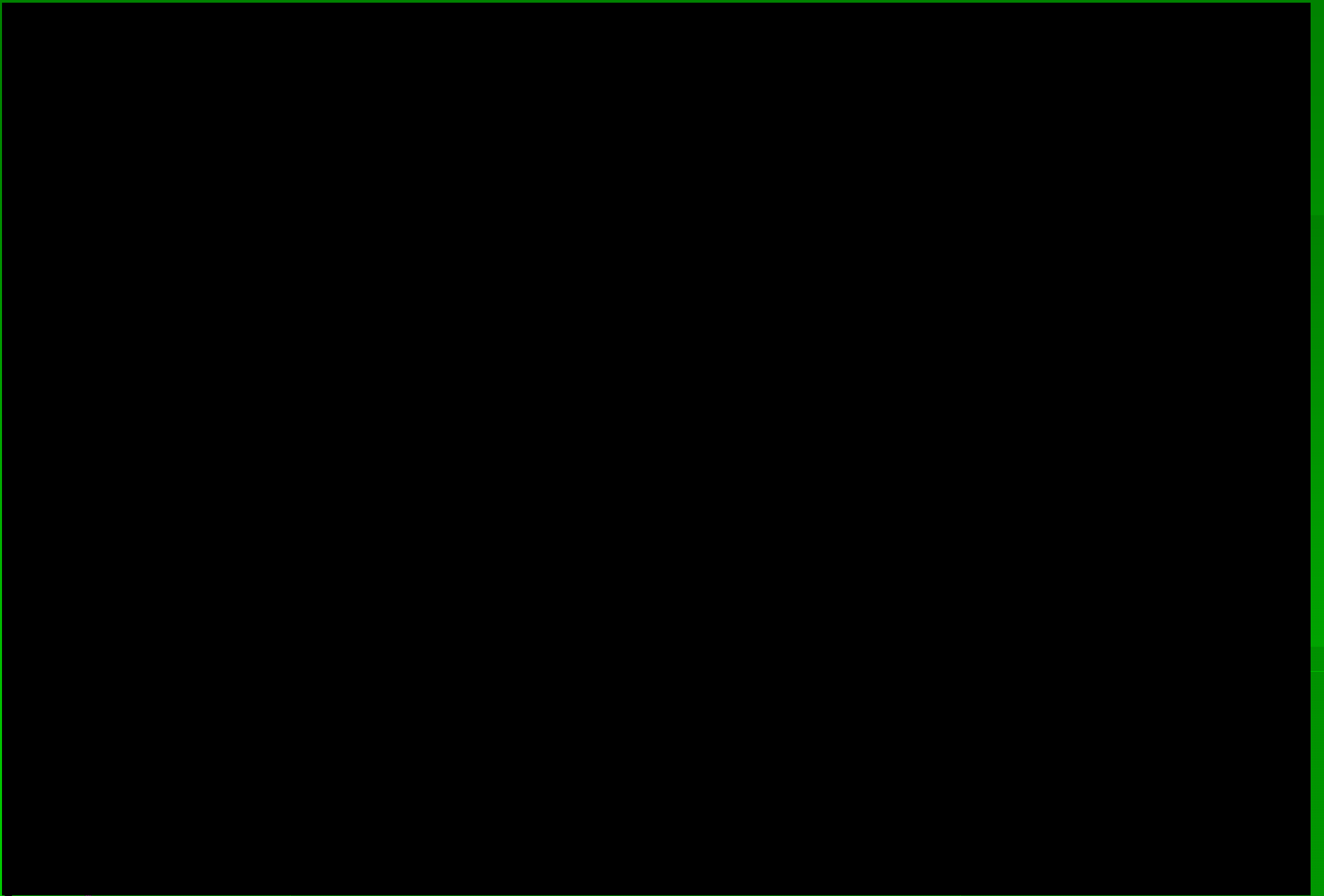
**Mark Hayden, N7YLA**

**And most important!**

*The Food !*

**Frank Bigelow, KG6TQV  
and the GERC staff**

# **Amateur Radio Today with Walter Cronkite**

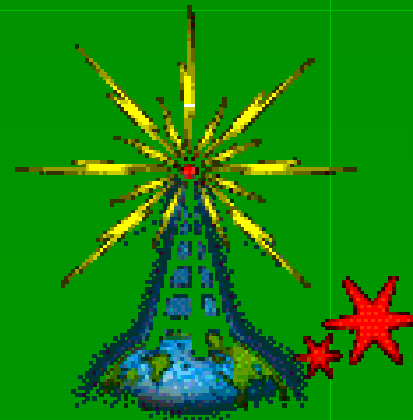


# Introduction:

- **Welcome to the world of Amateur (ham) Radio! Ham radio is a great opportunity for you to develop an exciting and fun hobby while at the same time serving others, such as providing radio communications in the event of an emergency when normal means of communications are not available.**



**When you have passed your 35 question entry level exam to earn your Technician Class license you will be authorized to join the nearly 700,000 licensed operators in the U.S. who communicate across town, around the world, and even into outer space!**



# What Do We Study?

- The FCC Technician Class (Element 2) Amateur Radio examination is selected from a pool of 392 questions, arranged in ten groups (topics) known as *subelements*.
- Subelement Topic 1 = “*FCC Rules, Station License Responsibilities*”, 4 questions from the pool of 43.
- Subelement Topic 2 = “*Control Operator Duties*”, 4 questions from the pool of 45.

**Subelement Topic 3 = “*Operating Practices*”, 4 questions from the pool of 42.**

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**Subelement Topic 4 = “*Radio and Electronic Fundamentals*”, 5 questions from the pool of 57.**

**Subelement Topic 5 = “*Station Setup and Operation*”, 4 questions from the pool of 47.**

Subelement Topic 6 = “*Communication Modes and Methods*”, 3 questions from the pool of 32.

Subelement Topic 7 = “*Special Operations*”, 2 questions from the pool of 22.

Subelement Topic 8 = “*Emergency and Public Service Communications*”, 3 questions from the pool of 34.

Subelement Topic 9 = “*Radio Waves, Propagation, and Antennas*”, 3 questions from the pool of 35.

Subelement Topic 10 = *Electrical and RF Safety*, 3 questions from the pool of 35.

**Total questions = 392**  
**Questions on Exam = 35**

All of the questions and multiple choice answers to the ten subelements are public information.

The bottom line is that the question pool contains over 11 times the number of questions contained in your 35 question examination. An applicant must know the answers to 26 questions or more on the test to pass with a minimum grade (74%). The FCC believes that a person who memorizes the pool can't help but learn something about ham radio!

# The Gordon West method

- In *Technician Class* , 7th edition, Gordon West has arranged all of the questions into 15 subject areas for a natural learning progression. This allows the student to study all the questions on similar subjects together rather than having to search through the entire question pool to match them up. No questions are left out.



“GORDO” – WB6NOA

# **Technician Class Syllabus**

- About ham radio & your license
- Your new call sign
- You are in control
- Mind our rules
- Technician class frequencies
- Your first radio
- Going on the air!
- Fun on repeaters
- Emergency!
- Weak signals
- Digital and space
- Bandwidth & interference
- Volts and amps
- Antennas
- Your safety



# Questions ?



?	?	?	
			?

**LET'S GET STARTED!**

**Please turn to page 31 of  
“Technician Class”**

# About Ham Radio & Your License

T1A07 (B) [97.5]

Who makes and enforces the rules for the Amateur Radio Service in the United States?

- A. The Congress of the United States
- B. The Federal Communications Commission
- C. The Volunteer Examiner Coordinators
- D. The Federal Bureau of Investigation

**F.C.C.**

## T1A02 (B) [97.1]

What is one of the basic purposes of the Amateur Radio Service as defined in Part 97?

- A. To support teaching of amateur radio classes in schools
- B. To provide a voluntary noncommercial communications service to the public, particularly in times of emergency
- C. To provide free message service to the public
- D. To allow the public to communicate with other radio services

## T1A08 (D) [97.1]

What are two of the five fundamental purposes for the Amateur Radio Service?

- A. To protect historical radio data, and help the public understand radio history
- B. To aid foreign countries in improving radio communications and encourage visits from foreign hams
- C. To modernize radio electronic design theory and improve schematic drawings
- D. To increase the number of trained radio operators and electronics experts, and improve international goodwill

T1A01 (A) [97.3(a)(1)]

Who is an amateur operator as defined in Part 97?

- A. A person named in an amateur operator/primary license grant in the FCC ULS database
- B. A person who has passed a written license examination
- C. The person named on the FCC Form 605 Application
- D. A person holding a Restricted Operating Permit

Remember DATABASE

## T1A09 (D) [97.3(a)(5)]

What is the definition of an amateur radio station?

- A. A station in a public radio service used for radio communications
- B. A station using radio communications for a commercial purpose
- C. A station using equipment for training new broadcast operators and technicians
- **D. A station in an Amateur Radio Service consisting of the apparatus necessary for carrying on radio communications**



## T1D02 (A) [97.5(b)(1)]

Who can become an amateur licensee in the US?

- A. Anyone except a representative of a foreign government
- B. Only a citizen of the United States
- C. Anyone except an employee of the US government
- D. Anyone



## T1D03 (D) [97.5(b)(1)]

What is the minimum age required to hold an amateur license?

- A. 14 years or older
- B. 18 years or older
- C. 70 years or younger
- D. **There is no minimum age requirement**



T1D04 (D) [97.5(a)]

What government agency grants your amateur radio license?

- A. The Department of Defense
- B. The Bureau of Public Communications
- C. The Department of Commerce
- D. The Federal Communications Commission

FCC

T1D01 (B) [97.17(a)]

Which of the following services are issued an operator station license by the FCC?

- A. Family Radio Service
- B. **Amateur Radio Service**
- C. General Radiotelephone Service
- D. The Citizens Radio Service

*Amateur = YOU!*

T1A03 (C) [97.501]

What classes of US amateur radio licenses may currently be earned by examination?

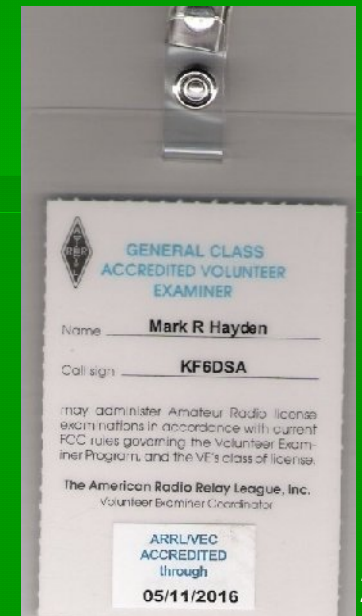
- A. Novice, Technician, General, Advanced
- B. Technician, General, Advanced
- C. Technician, General, Extra
- D. Technician, Tech Plus, General

**“T G E”**

## T1A04 (C) [97.509(b)]

### Who is a Volunteer Examiner?

- A. A certified instructor who volunteers to examine amateur teaching manuals
- B. An FCC employee who accredits volunteers to administer amateur license exams
- C. An amateur accredited by one or more VECs who volunteers to administer amateur license exams
- D. Any person who volunteers to examine amateur station equipment



T1A06 (D) [97.509(a)(b)(3)(i)]

How many and what class of Volunteer Examiners are required to administer an Element 2 Technician written exam?

- A. Three Examiners holding any class of license
- B. Two Examiners holding any class of license
- C. Three Examiners holding a Technician Class license
- D. Three Examiners holding a General Class license or higher

## T1D06 (C) [97.25(a)]

What is the normal term for an amateur station license grant?

- A. 5 years
- B. 7 years
- C. 10 years
- D. For the lifetime of the licensee

## T1D07 (A) [97.21(b)]

What is the grace period during which the FCC will renew an expired 10-year license without re-examination?

- A. 2 years
- B. 5 years
- C. 10 years

*Warning: You are not allowed to operate during this grace period.*



## T1D11 (A) [97.21(b)]

When are you permitted to continue to transmit if you forget to renew your amateur license and it expires?

- A. Transmitting is not allowed until the license is renewed and appears on the FCC ULS database
- B. When you identify using the suffix EXP
- C. When you notify the FCC you intend to renew within 90 days
- D. Transmitting is allowed any time during the 2-year grace period

You can check the FCC database directly or go to [www.qrz.com](http://www.qrz.com) regularly to see if they have posted your new call sign!

## T1D12 (A) [97.23]

Why must an Amateur radio operator have a correct name and mailing address on file with the FCC?

- A. To receive mail delivery from the FCC by the United States Postal Service
- B. So the FCC Field office can contact the licensee
- C. It isn't required when you haven't operated your station in a year
- D. So the FCC can locate your transmitting location

*Be sure to notify the FCC when you move!*

T2C02 (C ) [97.5(b)(1)]

How many amateur operator / primary station licenses may be held by one person?

- A. As many as desired
- B. One for each portable transmitter
- C. **Only one**
- D. One for each station location

**One amateur operator = One License !**

## T1D05 (C) [97.5(a)]

How soon may you transmit after passing the required examination elements for your first amateur radio license?

- A. Immediately
- B. 30 days after the test date
- C. As soon as your license grant appears in the FCC's ULS database
- D. As soon as you receive your license in the mail from the FCC

You can look for your new license in a few days! Go to [www.qrz.com](http://www.qrz.com) to search for your name on the database!

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The license class codes are T=Technician, G=General, and E=Extra.

ALCENIUS, VICTOR J	AC0FC	E	Issued
ALLEN, STANLEY R	KI6FHF	T	Issued
ALLISON, LARRY E	KI4RAT	T	Issued
ASH, JAMES R	KE7IWX	T	Issued
ATKINSON, TRAVIS D	KB0OUW	T	Renewed

## T1C01 (C) [97.5(a)]

What is required before you can control an amateur station in the US?

- A. You must hold an FCC restricted operator's permit for a licensed radio station
- B. You must submit an FCC Form 605 with a license examination fee
- C. You must be **named in** the FCC amateur license **database**, or be an alien with reciprocal operating authorization
- D. The FCC must issue you a Certificate of Successful Completion of Amateur Training

## T1C02 (B) [97.5(a)]

Where does a US amateur license allow you to transmit?

- A. From anywhere in the world
- B. From wherever the Amateur Radio Service is regulated by the FCC or where reciprocal agreements are in place
- C. From a country that shares a third party agreement with the US
- D. Only from the mailing address printed on your license

T1A05 (A) [97.505(a)(6)]

How long is a CSCE valid for license upgrade purposes?

- A. 365 days
- B. Until the current license expires
- C. Indefinitely
- D. Until two years following the expiration of the current license


*CSCE = Certificate of Successful of Completion of Examination*





# This is an example of a CSCE.

## DO NOT LOSE IT!

<b>VEC:</b> American Radio Relay League/VEC			<p>The applicant named herein has presented the following valid exam element credit(s) in order to qualify for the license earned category indicated below: Circle the <b>bold</b> text from one or more of these examples: -for pre 3/21/87 Technicians circle 3/21/87 Tech-EL 1+3; -for pre 2/14/91 Technicians circle 2/14/91 Tech-EL 1; -for lifetime Novice code credit circle Novice-EL 1; -for a valid or expired-less-than-5-years FCC Radiotelegraph license/permit circle FCC Telegraph-EL 1;</p> <p><b>NOTE TO VE TEAM:</b> COMPLETELY CROSS OUT ALL BOXES BELOW THAT DO NOT APPLY TO THIS CANDIDATE</p> <p><b>EXAM ELEMENTS EARNED</b></p> <p>passed 5-wpm-code element 1 _____</p> <p>passed written element 2 _____</p> <p>passed written element 3 _____</p> <p>passed written element 4 _____</p> <p><b>NEW LICENSE CLASS EARNED</b></p> <p><u>TECHNICIAN</u></p> <p>TECHNICIAN w/HF _____</p> <p>GENERAL _____</p> <p>EXTRA _____</p>
<b>CERTIFICATE of SUCCESSFUL COMPLETION of EXAMINATION</b>			
Test Site (city/state): <u>Glendora, CA</u>	Test Date: <u>1/18/2006</u>		
<b>CREDIT for ELEMENTS PASSED</b> You have passed the telegraphy and/or written element(s) indicated at right. You 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, if you wish to upgrade your license class again while a newly-upgraded license application is pending with the FCC.			
<b>LICENSE UPGRADE NOTICE</b> If you also hold a valid FCC-issued Amateur radio license grant, this Certificate validates temporary operation with the <u>operating privileges</u> 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. <b>Note:</b> If you hold a current FCC-granted (codeless) Technician class operator license, and if this certificate indicates Element 1 credit, this certificate indefinitely permits you HF operating privileges as specified in Section 97.301(e) of the FCC rules. This document must be kept indefinitely with your Technician class operator license in order to use these privileges.			
<b>LICENSE STATUS INQUIRIES</b> 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 <a href="http://www.fcc.gov/wtb/uls">http://www.fcc.gov/wtb/uls</a> ("License Search" tab), or see the ARRL Web at <a href="http://www.arrl.org/fcc/fcclook.php3">http://www.arrl.org/fcc/fcclook.php3</a> ; 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.			
<b>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.</b>			
Candidate's signature <u>[Signature]</u>	VE #1 <u>Thomas J. Morgan KB6JUE</u> signature _____ call sign _____		
Candidate's name <u>Lytle K. Bidler, II</u> Call sign <u>None</u> (if none, write none)	VE #2 <u>Mark R. Hyslop KF6DSA</u> signature _____ call sign _____		
Address <u>1508 Crowley Way</u>	VE #3 <u>Chuck M. Hays K66TPV</u> signature _____ call sign _____		
City <u>Placentia</u> State <u>CA</u> ZIP <u>92870</u>	Candidate's copy=white•ARRL/VEC's copy=pink•VE Team's copy=yellow		

# Your New Call Sign (p. 39)

T1B03 (C) [97.17(d)]

What system does the FCC use to select new amateur radio call signs?

- A. Call signs are assigned in random order
- B. The applicant is allowed to pick a call sign
- C. Call signs are assigned in sequential order
- D. Volunteer Examiners choose an unassigned call sign

## T1B09 (B)

What letters must be used for the first letter in US amateur call signs?

- A. K, N, U and W
- B. A, K, N and W
- C. A, B, C and D
- D. A, N, V and W

### Call Sign Examples:

KG6RGD = Roy Bishop

N2GZK = John Zupko

W6LDS = Andy Johnson

AC7O = Allen Wolf

## T1B10 (D)

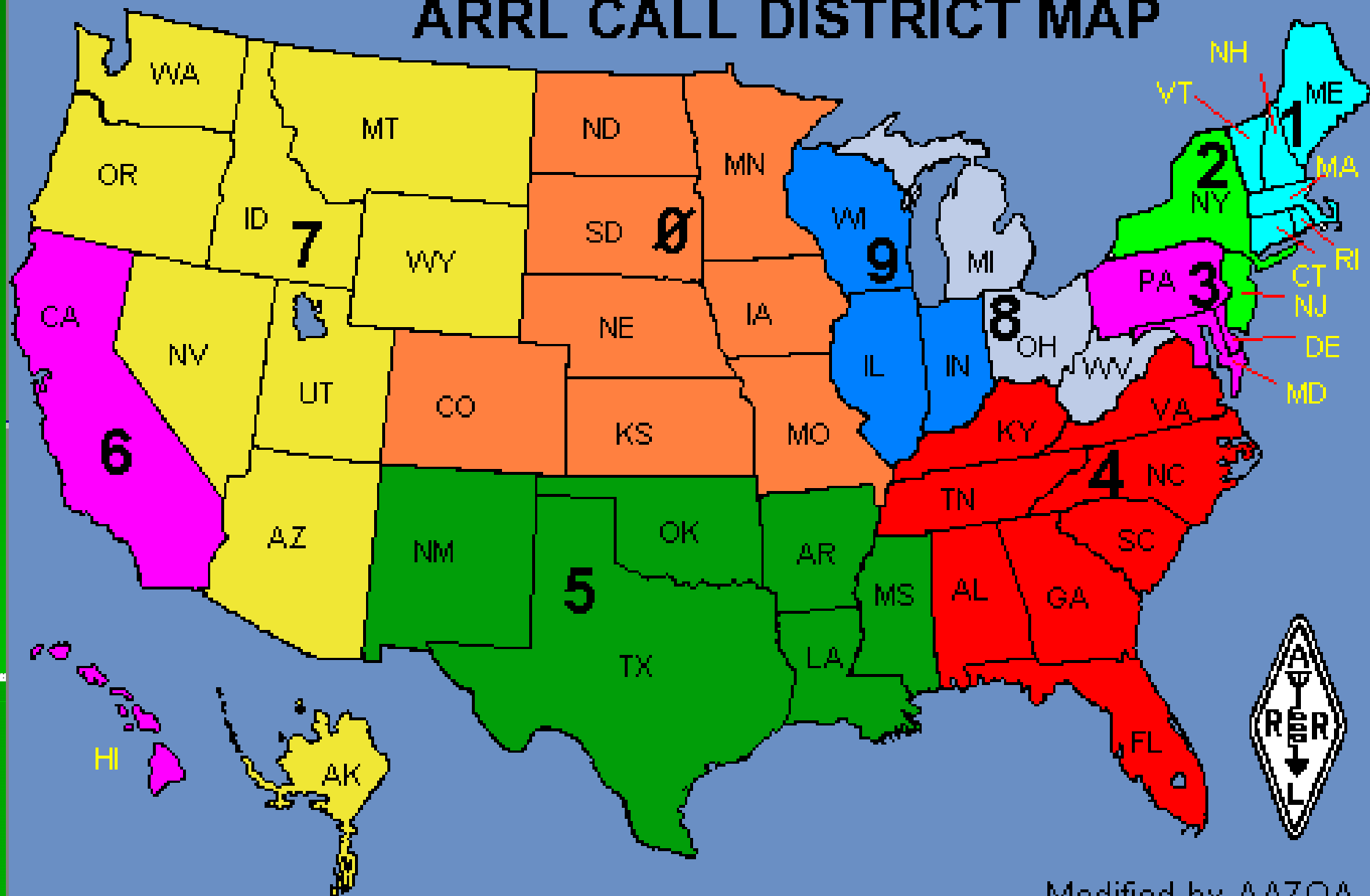
What numbers are used in US amateur call signs?

- A. Any two-digit number, 10 through 99
- B. Any two-digit number, 22 through 45
- C. A single digit, 1 through 9
- D. A single digit, 0 through 9

There are ten call sign areas in the continental United States, 0 through 9.



# ARRL CALL DISTRICT MAP



Modified by AA7OA



T1B08 (C)

Which of the following call signs is a valid US amateur call?

- A. UZ4FWD
- B. KBL7766
- C. **KB3TMJ**
- D. VE3TWJ

T2B01 (B) [97.119(a)]

What must you transmit to identify your amateur station?

- A. Your tactical ID
- B. Your **call sign**
- C. Your first name and your location
- D. Your full name

## T2B03 (B) [97.119(a)]

How often must an amateur station transmit the assigned call sign?

- A. At the beginning of each transmission and every 10 minutes during communication
- B. Every 10 minutes during communications and at the end of each communication
- C. At the end of each transmission
- D. Only at the end of the communication



T2B06 (B) [97.119(a)]

What is the longest period of time an amateur station can operate without transmitting its call sign?

- A. 5 minutes
- B. 10 minutes
- C. 15 minutes
- D. 30 minutes

## T2B05 (C) [97.119(a)]

What identification is required when two amateur stations end communications?

- A. No identification is required
- B. One of the stations must transmit both stations' call signs
- C. Each station must transmit its own call sign
- D. Both stations must transmit both call signs

## T3A11 (A) [97.119(b)(2)]

Why should you use the International Telecommunication Union (ITU) phonetic alphabet when identifying your station?

- A. The words are **internationally recognized** substitutes for letters
- B. There is no advantage
- C. The words have been chosen to represent amateur radio terms
- D. It preserves traditions begun in the early days of amateur radio

## T3A09 (A) [97.119(b)(2)]

Why should you avoid using cute phrases or word combinations to identify your station?

- A. They are not easily understood by some operators
- B. They might offend some operators
- C. They do not meet FCC identification requirements
- D. They might be interpreted as codes or ciphers intended to obscure your identification

For example K6OBU is “Oscar Bravo Uniform” NOT “Old Baggy Underwear”

T1B01 (C) [97.3(a)(28)]

What is the ITU?

- A. The International Telecommunications Utility
- B. The International Telephone Union
- C. The International Telecommunication Union
- D. The International Technology Union

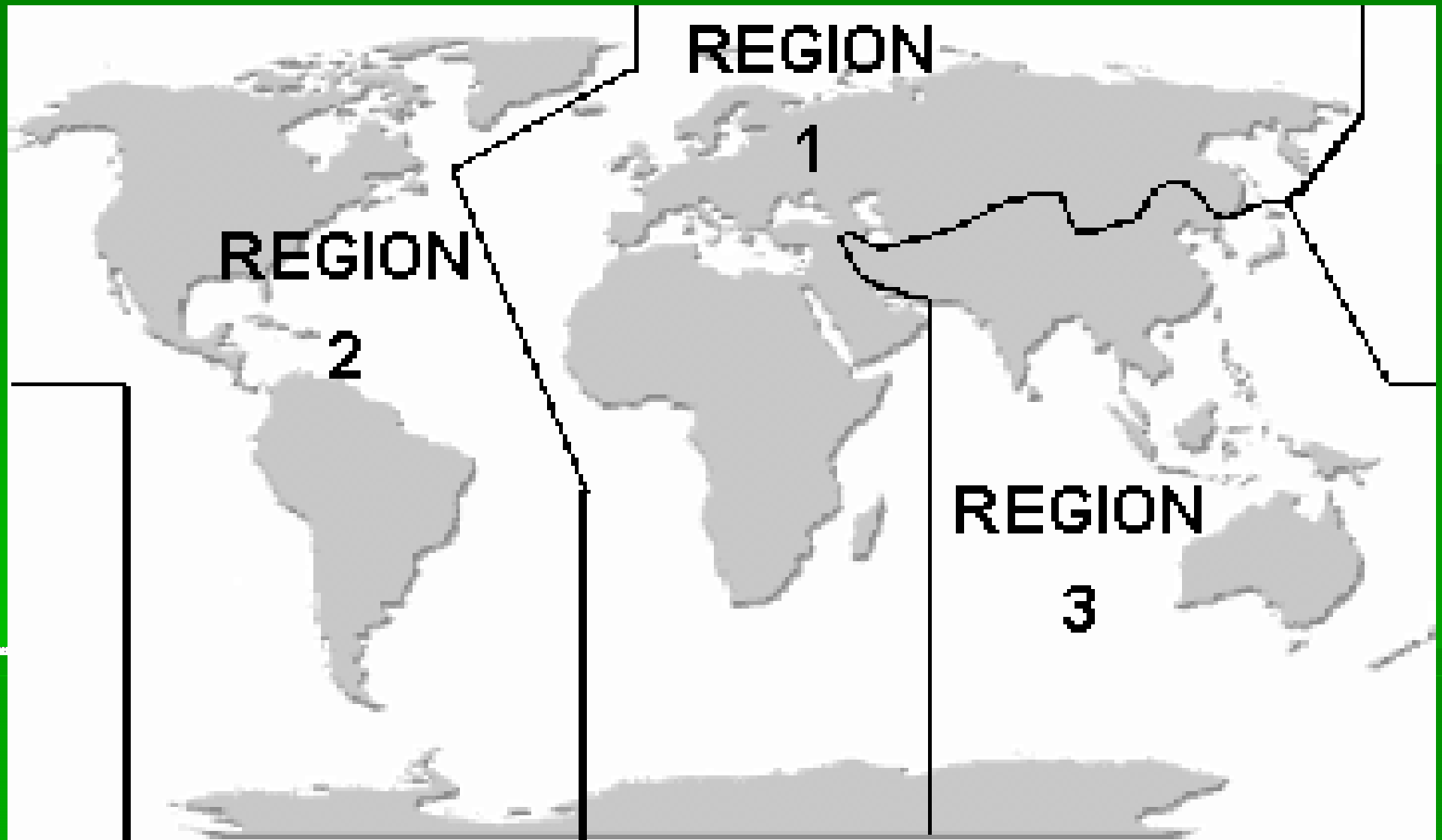


## T1B02 (A) [97.301]

What is the purpose of ITU Regions?

- A. They are used to assist in the management of frequency allocations
- B. They are useful when operating maritime mobile
- C. They are used in call sign assignments
- D. They must be used after your call sign to indicate your location





## T3A06 (A)

What must an amateur do when making a transmission to test equipment or antennas?

- A. Properly identify the station
- B. Make test transmissions only after 10:00 PM local time
- C. Notify the FCC of the test transmission
- D. State the purpose of the test during the test procedure



## T3A07 (D)

Which of the following is true when making a test transmission?

- A. Station identification is not required if the transmission is less than 15 seconds
- B. Station identification is not required if the transmission is less than 1 watt
- C. Station identification is required only if your station can be heard
- D. Station identification is required at least every ten minutes **and at the end of every transmission.**

## T1B04 (A) [97.19(d)]

What FCC call sign program might you use to obtain a call sign containing your initials?

- A. The **vanity** call sign program
- B. The sequential call sign program
- C. The special event call sign program
- D. There is no FCC provision for choosing a your call sign

Example of actual vanity call signs: K6DGM = David G. Morrill ; W6LDS = Latter day Saints; KN0LAN = Nolan; KZ1MOM = Crazy 1 mom

## T1B05 (B) [97.17(b)(2)]

How might an amateur radio club obtain a club station **call sign**?

- A. By applying directly to the FCC in Gettysburg, PA
- B. By applying through a Club Station **Call Sign** Administrator
- C. By submitting a FCC Form 605 to the FCC in Washington, DC
- D. By notifying a VE team using NCVEC Form 605

- T2D11 (D) [97.113(d)]

When is it permissible for the control operator of a club station to accept compensation for sending information bulletins or Morse code practice?

- A. When compensation is paid from a non-profit organization
- B. When the club station license is held by a non-profit organization
- C. Anytime compensation is needed
- D. When the station makes those transmissions for at least 40 hours per week

Example: You send morse code practice for more than 40 hours per week, you could be on the payroll of the organization doing this.



## T7A10 (C)

What is a special event station?

- A. A station that sends out birthday greetings
- B. A station that operates only on holidays
- C. A **temporary** station that operates in conjunction with an activity of special significance
- D. A station that broadcasts special events

Example: The Special Event Call sign used for the Covina Christmas Parade will be W6C, or “Whiskey Six Charlie”

## T1B06 (C)

Who is eligible to apply for temporary use of a 1-by-1 format Special Event call sign?

- A. Only Amateur Extra class amateurs
- B. Only military stations
- C. Any FCC-licensed amateur
- D. Only trustees of amateur radio club stations

## T2B08 (D) [97.119(d)]

How often must you identify using your assigned call sign when operating while using a special event call sign?

- A. Every 10 minutes
- B. Once when the event begins and once when it concludes
- C. Never
- D. Once per hour

Example: The Christmas parade net operator will use the call sign W6C at least every ten minutes but he will only need to identify by his own call sign once per hour.

# You Are In Control (p. 47)

T1D08 (D) [97.103(a)]

What is your responsibility as a station licensee?

- A. You must allow another amateur to operate your station upon request
- B. You must be present whenever the station is operated
- C. You must notify the FCC if another amateur acts as the control operator
- D. Your station must be operated in accordance with the FCC rules



Current FCC Approved Rules for Spread Spectrum Radios

1 Watt at the Radio - 4 Watts EIRP

Operate only in FCC Part 15 (ISM) Bands

902 - 928 Mhz

2.4 - 2.4835 Ghz

5.725 - 5.85 Ghz



## T2C01 (B) [97.7]

What must every amateur station have when transmitting?

- A. A frequency-measuring device
- B. A **control operator**
- C. A beacon transmitter
- D. A third party operator



Control  
Operator

## T2C05 (C) [97.7]

When must an amateur station have a control operator?

- A. Only when training another amateur
- B. Whenever the station receiver is operated
- C. Whenever the station is **transmitting**
- D. A control operator is not needed

You can own a ham radio and listen in, but you must not transmit until you have your license.

## T2C12 (C) [97.3(a)(13)]

What is the definition of a **control operator** of an amateur station?

- A. Anyone who operates the controls of the station
- B. Anyone who is responsible for the station's equipment
- C. An operator designated by the licensee to be **responsible for the station's transmissions** to assure compliance with FCC rules
- D. The operator with the highest class of license who is in control of the station

T2C04 (D) [97.3(a)(1)(2)]

Who is **responsible for the transmissions** from an amateur station?

- A. Auxiliary operator
- B. Operations coordinator
- C. Third-party operator
- D. **Control operator**

## T2C06 (D) [97.3]

What is the **control point** of an amateur station?

- A. The on/off switch of the transmitter
- B. The input/output port of a packet controller
- C. The variable frequency oscillator of a transmitter
- D. The location at which the **control operator** function is performed

## T2C08 (A) [97.3(a)]

What are the three types of station control permitted and recognized by FCC rule?

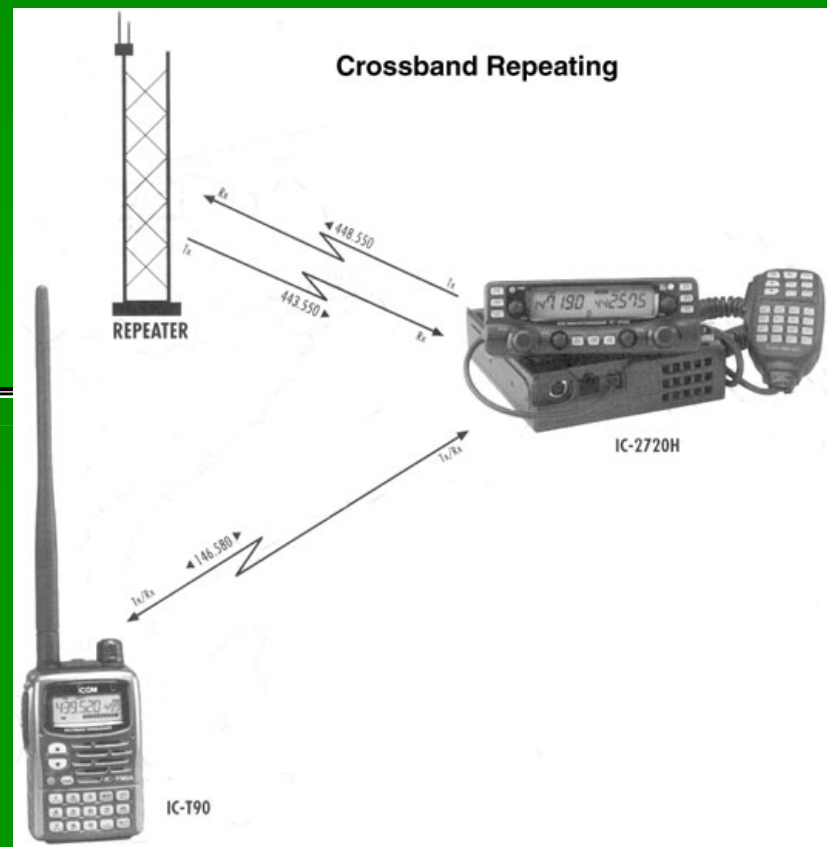
- A. Local, remote and automatic control
- B. Local, distant and automatic control
- C. Remote, distant and unauthorized control
- D. All of the choices are correct

# Local Control - Station to Station





**Remote Control** : An example would be where a hiker remotely transmits to his car mobile radio which in turn retransmits over another band. However, the operator must be able to fully control his mobile radio to be legal.





- **Automatic:** 146.730 Mhz Output, N6TKY, 146.130 Mhz Input w/sub-audible tone 85.4 hz. The repeater is located on Hayfork Bally Mountain at an elevation of 6,000' in a secure vault in the area of the USFS Fire Lookout.



## Trinity Radio Club Repeater

## T2C10 (D) [97.109(a)]

What type of control is being used when ~~transmitting using a handheld radio?~~

- A. Radio control
- B. Unattended control
- C. Automatic control
- D. **Local** control

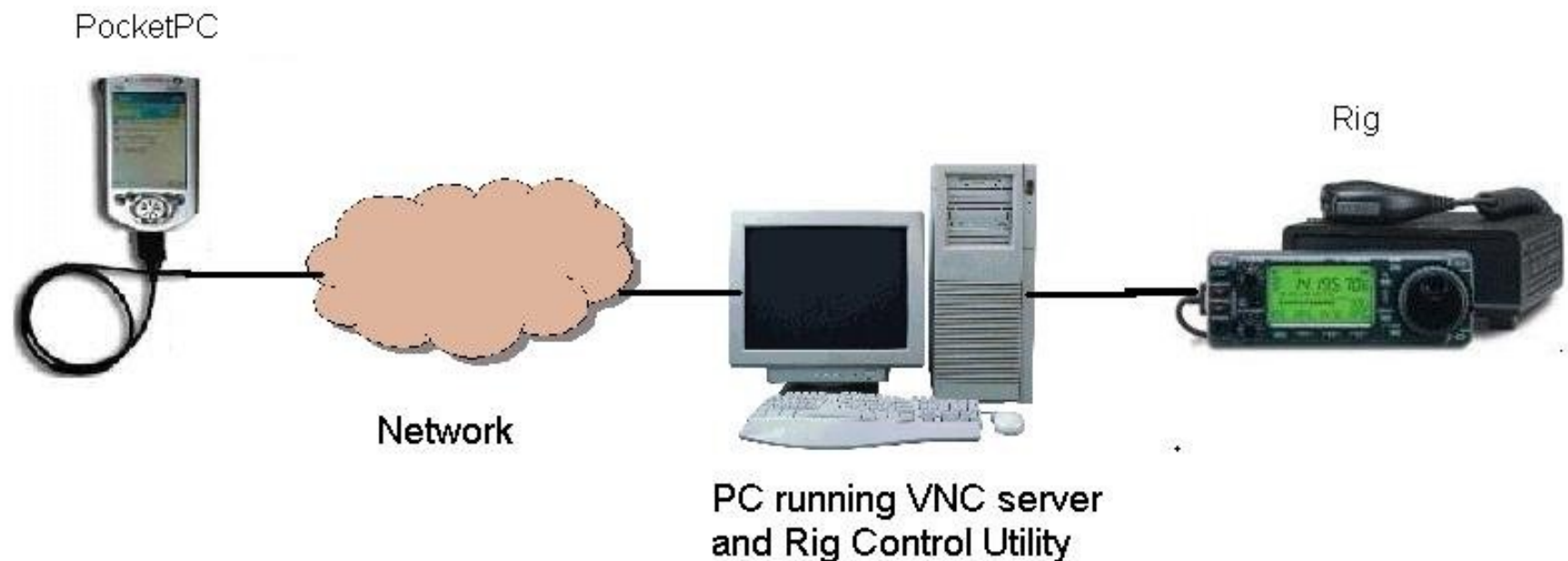


## T2C11 (B) [97.3]

What type of control is used when the control operator is not at the station location but can still make changes to a transmitter?

- A. Local control
- B. Remote control
- C. Automatic control
- D. Uncontrolled

- Remote Ham Radio Station Control using VNC with PocketPC



## T2D10 (B) [97.109(b)]

Why are unlicensed persons in your family not allowed to transmit on your amateur station if you are not there?

- A. They must not use your equipment without your permission
- B. They **must be licensed** before they are allowed to be control operators
- C. They must know how to use proper procedures and Q signals
- D. They must know the right frequencies and emissions for transmitting

## T2D02 (A) [97.105(b)]

What operating privileges are allowed when another amateur holding a higher class license is controlling your station?

- A. All privileges allowed by the higher class license
- B. Only the privileges allowed by your license
- C. All the emission privileges of the higher class license, but only the frequency privileges of your license
- D. All the frequency privileges of the higher class license, but only the emission privileges of your license

## T2D03 (B) [97.105(a)]

What operating privileges are allowed when you are the control operator at the station of another amateur who has a higher class

license than yours?

- A. Any privileges allowed by the higher class license
- B. Only the privileges allowed by **your license**
- C. All the emission privileges of the higher class license, but only the frequency privileges of your license
- D. All the frequency privileges of the higher class license, but only the emission privileges of your license

Generally always use your own license privileges.

## T2B10 (B) [97.119(e)]

What is the correct way to identify when visiting a station if you hold a higher class license than that of the station licensee and you are using a frequency not authorized to his class of license?

- A. Send your call sign first, followed by his call sign
- B. Send his call sign first, followed by your call sign
- C. Send your call sign only, his is not required
- D. Send his call sign followed by "/KT"



## T2D01 (A) [97.103(a)]

Who is responsible for proper operation if you transmit from another amateur's station?

- A. **Both of you**
- B. Only the other station licensee
- C. Only you as the control operator
- D. Only the station licensee, unless the station records shows another control operator at the time

## T1C10 (D) [97.111]

When may a US amateur operator communicate with an amateur in a foreign country?

- A. Only when a third-party agreement exists between the US and the foreign country
- B. At any time except between 146.52 and 146.58 MHz
- C. Only when a foreign amateur uses English
- D. At any time unless prohibited by either government

## T2B07 (C) [97.119(b)(2)]

What is a permissible way to identify your station when you are speaking to another amateur operator using a language other than English?

- A. You must identify using the official version of the foreign language
- B. Identification is not required when using other languages
- C. You must identify using the English language
- D. You must identify using phonetics

Identify your station in english every ten minutes!

## T1B07 (A) [97.107]

When are you allowed to operate your amateur station in a foreign country?

- A. When there is a reciprocal operating agreement between the countries
- B. When there is a mutual agreement allowing third party communications
- C. When authorization permits amateur communications in a foreign language
- D. When you are communicating with non-licensed individuals in another country

The USA has reciprocal operating agreements with 75 other countries.

# Mind Our Rules (page 53)

T2D09 (A)

- How might you best keep unauthorized persons from using your amateur station?
- A. Disconnect the power and microphone cables when not using your equipment
- B. Connect a dummy load to the antenna
- C. Put a "Danger - High Voltage" sign in the station
- D. Put fuses in the main power line

Take the microphone with you!

## T1C11 (D) [97.113(a)(5)]

Which of the following types of communications are **not** permitted in the Amateur Radio Service?

- A. Brief transmissions to make adjustments to the station
- B. Brief transmissions to establish two-way communications with other stations
- C. Transmissions to assist persons learning or improving proficiency in CW
- D. **Communications on a regular basis that could reasonably be furnished alternatively through other radio services**

**No business communications!**

T2A09 (C) [97.113(2)]

When does the FCC allow an amateur radio station to be used as a method of communication for hire or material compensation?

- A. Only when making test transmissions
- B. Only when news is being broadcast in times of emergency
- C. Only when in accordance with part 97 rules
- D. Only when your employer is using amateur radio to broadcast advertising

There are exceptions.

## T2D04 (B) [97.113(a)(3)]

Which of the following is a prohibited amateur radio transmission?

- A. Using amateur radio to seek emergency assistance
- B. Using amateur radio for conducting business
- C. Using an amateur phone patch to call for a taxi or food delivery
- D. Using an amateur phone patch to call home to say you are running late



T2A10 (B) [97.113(a)(3),(a)5(e)]

What type of communications are prohibited when using a repeater autopatch?

- A. Calls to a recorded weather report
- B. Calls to your employer requesting directions to a customer's office
- C. Calls to the police reporting a traffic accident
- D. Calls to a public utility reporting an outage of your telephone

T2A03 (C) [97.113(a)(4), 97.211(b), 97.217]

When is the transmission of codes or ciphers allowed to hide the meaning of a message transmitted by an amateur station?

- A. Only during contests
- B. Only when operating mobile
- C. Only when transmitting control commands to space stations or radio control craft
- D. Only when frequencies above 1280 MHz are used



Flying RC aircraft  
is a very popular  
hobby!



## T2A07 (C) [97.113(a)(4)]

Which of the following are specifically prohibited in the Amateur Radio Service?

- A. Discussion of politics
- B. Discussion of programs on broadcast stations
- C. Indecent and obscene language
- D. Morse code practice

If you hear trash talk, ignore it! Do not respond. Move to another frequency.

## T3C05 (D) [97.113(a)(4)]

Why is indecent and obscene language prohibited in the Amateur Service?

- A. Because it is offensive to some individuals
- B. Because young children may intercept amateur communications with readily available receiving equipment
- C. Because such language is specifically prohibited by FCC Rules
- D. **All of these choices are correct**

Unregulated Citizens Band radio has been known for a great deal of trash talk. Most hams avoid CB radio.

## T3C08 (B) [97.113(a)(4)]

Where can an official list be found of prohibited obscene and indecent words that should not be used in amateur radio?

A. On the FCC web site

B. **There is no official list of prohibited obscene and indecent words**

C. On the Department of Commerce web site

D. The official list is in public domain and found in all amateur study guides

Again, indecency is NOT TOLERATED ! Move on to another frequency and do not try to correct the violator.

## T2B02 (A) [97.119(a)]

What is a transmission called that does not contain a station identification?

- A. Unidentified communications or signals
- B. Reluctance modulation
- C. Test emission
- D. Intentional interference

It is illegal to not give your call sign at all. Sometimes hams key down their microphone to hear the “courtesy tone” of a repeater with out identifying themselves. This is known as “kerchunking” and is illegal.

## T3A05 (C) [97.119(a)]

What term describes a brief test transmission that does not include any station identification?

- A. A test emission with no identification required
- B. An illegal un-modulated transmission
- C. **An illegal unidentified transmission**
- D. A non-voice ID transmission



## T2A05 (C) [97.119(b)]

When may an amateur station transmit unidentified communications?

- A. Only during brief tests not meant as messages
- B. Only when they do not interfere with others
- C. Only when sent from a space station or to control a model craft
- D. Only during two-way or third party communications

Radio-controlled model airplanes and boats as well as amateur satellites are not controlled by voice signals, rather by tones. This is perfectly legal.

## T3D05(C) [97.101(d)]

When may you deliberately interfere with another station's communications?

- A. Only if the station is operating illegally
- B. Only if the station begins transmitting on a frequency you are using
- C. **Never**
- D. You may cause deliberate interference because it can't be helped during crowded band conditions

**NEVER! NEVER! NEVER!**

## T1A10 (B) [97.3(A)(23)]

What is a transmission called that disturbs other communications?

- A. Interrupted CW
- B. **Harmful interference**
- C. Transponder signals
- D. Unidentified transmissions

Such behavior is rare on the ham bands. Thankfully!

## T3D04 (B)

What is the proper course of action if you unintentionally interfere with another station?

- A. Rotate your antenna slightly
- B. Properly identify your station and move to a different frequency
- C. Increase power
- D. Change antenna polarization

Before you move to another frequency, you might very briefly apologize too!

## T2A04 (A) [97.113(a)(4)]

When may an amateur station transmit false or deceptive signals?

- A. **Never**
- B. When operating a beacon transmitter in a "fox hunt" exercise
- C. Only when making unidentified transmissions
- D. When needed to hide the meaning of a message for secrecy

**NEVER! NEVER! NEVER!**

## T3C06 (B)

Why should amateur radio operators avoid the use of racial or ethnic slurs when talking to other stations?

- A. Such language is prohibited by the FCC
- B. It is offensive to some people and reflects a poor public image
  - on all amateur radio operators
- C. Some of the terms used may be unfamiliar to other operators
- D. Your transmissions might be recorded for use in court

## T2A02 (A) [97.113(a)(4), 97.113(e)]

When is an amateur station authorized to transmit music?

- A. **Amateurs may not transmit music, except as incidental to an authorized rebroadcast of space shuttle communications**
- B. Only when the music produces no spurious emissions
- C. Only to interfere with an illegal transmission
- D. Only when the music is above 1280 MHz

Wake – up music has been sent to astronauts on the Space Shuttle.



## T8B10 (B)

What should you do if a reporter asks to use your amateur radio transceiver to make a news report?

- A. Allow the use but give your call sign every 10 minutes
- B. Advise them that the FCC prohibits such use
- C. Tell them it is OK as long as you do not receive compensation
- D. Tell the reporter that you must approve the material beforehand



## T2A06 (A) [97.3(a)(10)]

What does the term broadcasting mean?

- A. Transmissions intended for reception by the general public either direct or relayed
- B. Retransmission by automatic means of programs or signals from non-amateur stations
- C. One-way radio communications, regardless of purpose or content
- D. One-way or two-way radio communications between two or more stations

## T2A01 (A) [97.113(b)]

When is an amateur station authorized to transmit information to the general public?

- A. **Never**
- B. Only when the operator is being paid
- C. Only when the transmission lasts more than 10 minutes
- D. Only when the transmission lasts longer than 15 minutes

T2A08 (B) [97.3(a)(10), 97.113(b)]

Which of the following one-way communications may not be transmitted in the Amateur Radio Service?

- A. Telecommand of model craft
- B. Broadcasts intended for reception by the general public
- C. Brief transmissions to make adjustments to the station
- D. Morse code practice

## T3C09 (D) [97.113(a)(4)]

What type of subjects are not prohibited communications while using amateur radio?

- A. Political discussions
- B. Jokes and stories
- C. Religious preferences
- D. All of these answers are correct

## T3B07 (D)

Which of these statements is true about legal power levels on the amateur bands?

- A. Always use the maximum power allowed to ensure that you complete the contact
- B. An amateur may use no more than 200 Watts PEP to make an amateur contact
- C. An amateur may use up to 1500 Watts PEP on any amateur frequency
- D. **An amateur must use the minimum transmitter power necessary to carry out the desired communication**

Always use the minimum power required to make contact with another station.

## T2D06 (B) [97.5(b)(2)]

How many persons are required to be members of a club for a club station license to be issued by the FCC?

- A. At least 5
- B. **At least 4**
- C. A trustee and 2 officers
- D. At least 2

## T1D10 (B) [97.23]

The FCC requires which address to be kept up to date on the Universal Licensing System database?

- A. The station location address
- B. **The station licensee mailing address**
- C. The station location address and mailing address
- D. The station transmitting location address

## T1D09 (A) [97.23]

When may the FCC revoke or suspend a license if the mailing address of the holder is not current with the FCC?

- A. If mail is returned to the FCC as undeliverable
- B. When the licensee transmits without having updated the address
- C. When the licensee operates portable at a different address
- D. If the address is not updated within the 2 year grace period



## T2D08 (B) [97.103(c)]

When is the FCC allowed to inspect your station equipment and station records?

- A. Only on weekends
- B. **At any time upon request**
- C. Never
- D. Only during daylight hours

## T1C03 (B) [97.111]

Under what conditions are amateur stations allowed to communicate with stations operating in other radio services?

- A. When other radio services make contact with amateur stations
- B. **When authorized by the FCC**
- C. When communicating with stations in the Family Radio Service
- D. When commercial broadcast stations are off the air

## T2B11 (A) [97.119(f)(2)]

When exercising the operating privileges earned by examination upgrade of a license what is meant by use of the indicator "/AG"?

A. **Authorized General**

~~B. Adjunct General~~

C. Address as General

D. Automatically General

Once you earn your General band privileges you can use them on the air!

# Technician Class

## Frequencies (p. 62)

T4B08 (C)

What are sound waves in the range between 300 and 3000 Hertz called?

- A. Test signals
- B. Ultrasonic waves
- C. **Voice frequencies**
- D. Radio frequencies

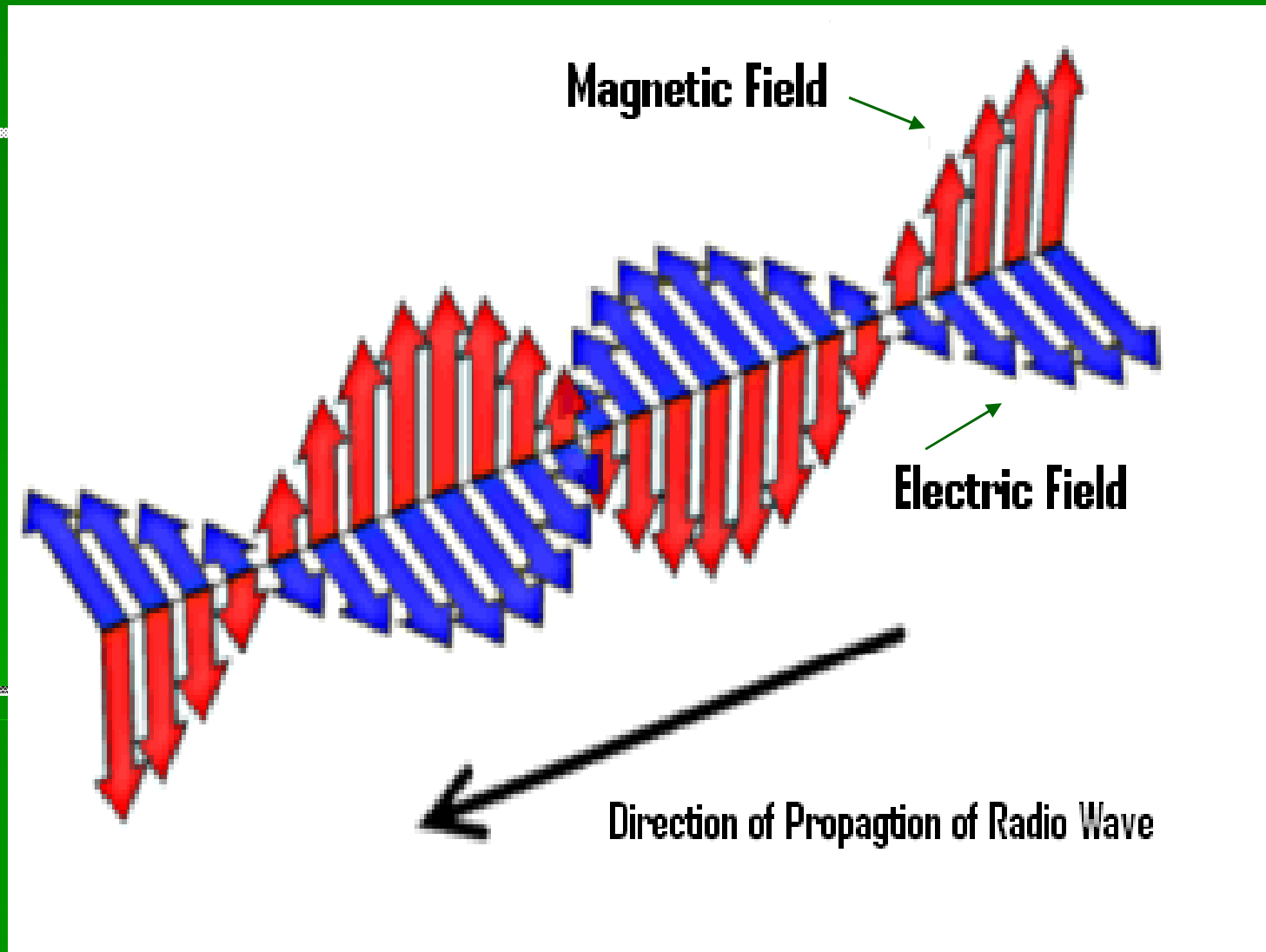
These are the sound frequencies that we can hear

## T4B04 (C)

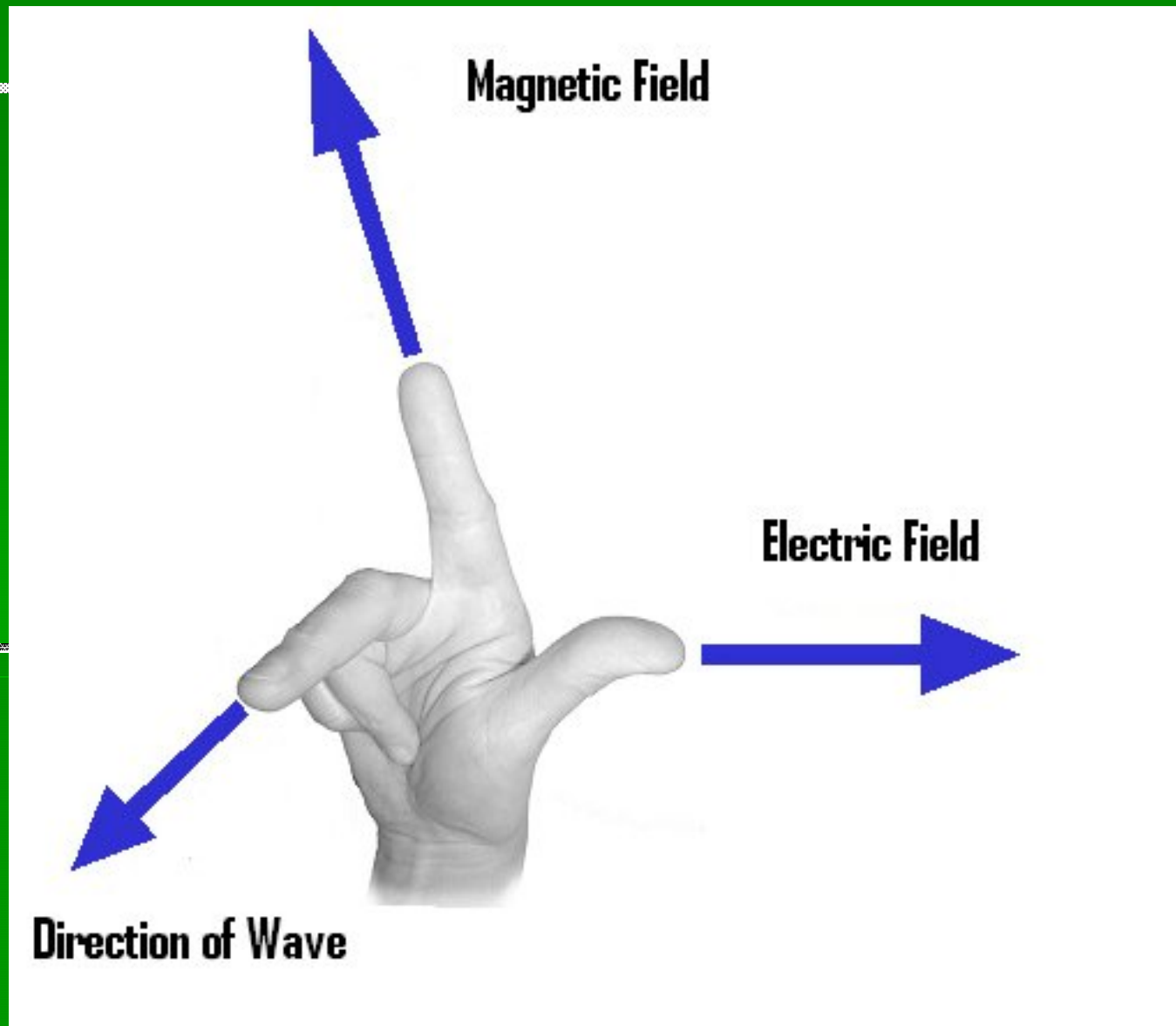
Electromagnetic waves that oscillate more than 20,000 times per second as they travel through space are generally referred to as what?

- A. Gravity waves
- B. Sound waves
- C. **Radio waves**
- D. Gamma radiation

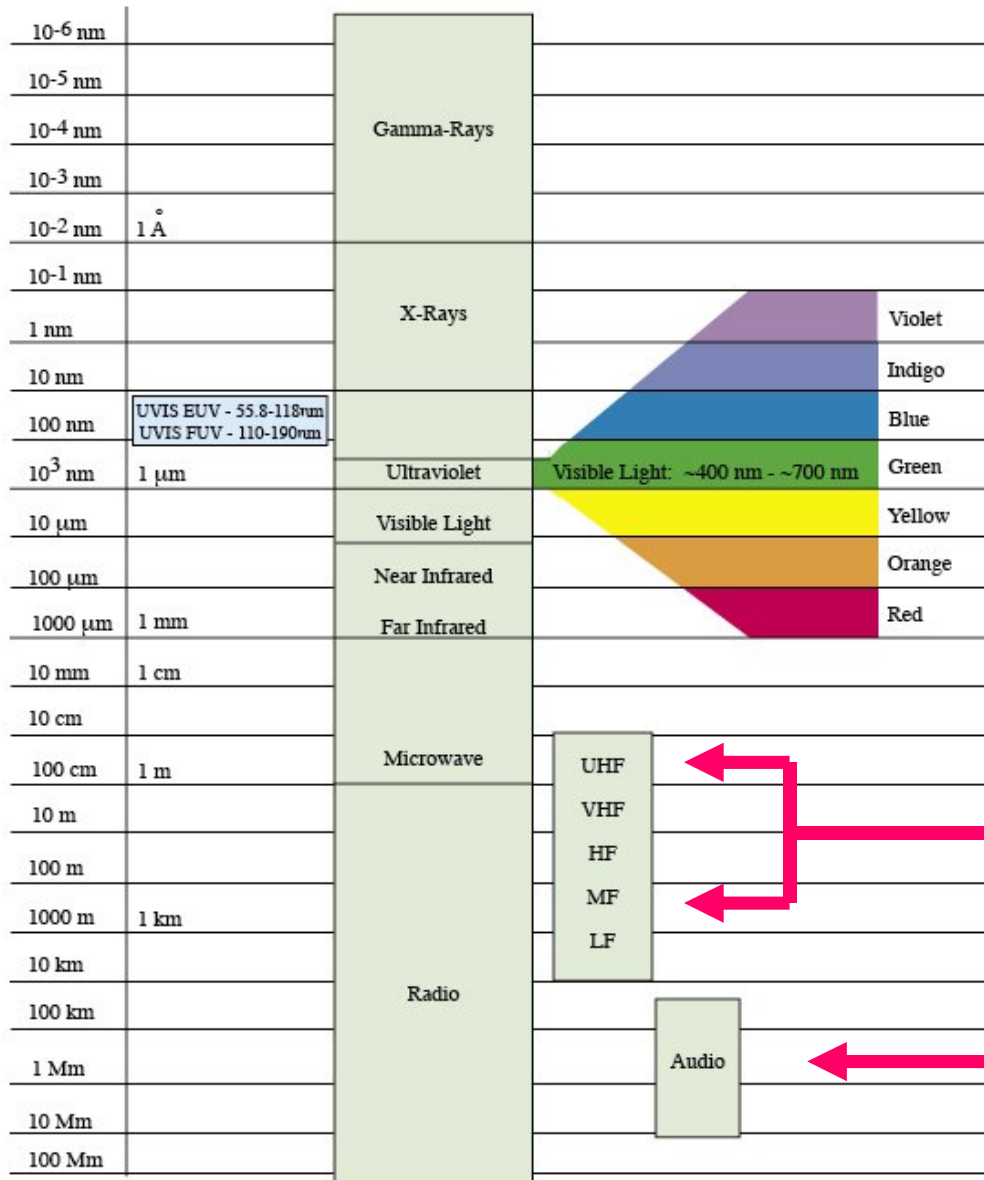
# Components of Electromagnetic (Radio) Waves



# Electric and Magnetic Fields Radiating from an Antenna



## The Electromagnetic Spectrum



nm=nanometer, Å=angstrom, μm=micrometer, mm=millimeter,  
cm=centimeter, m=meter, km=kilometer, Mm=Megameter

Ham Radio

Voice



## T4B05 (A)

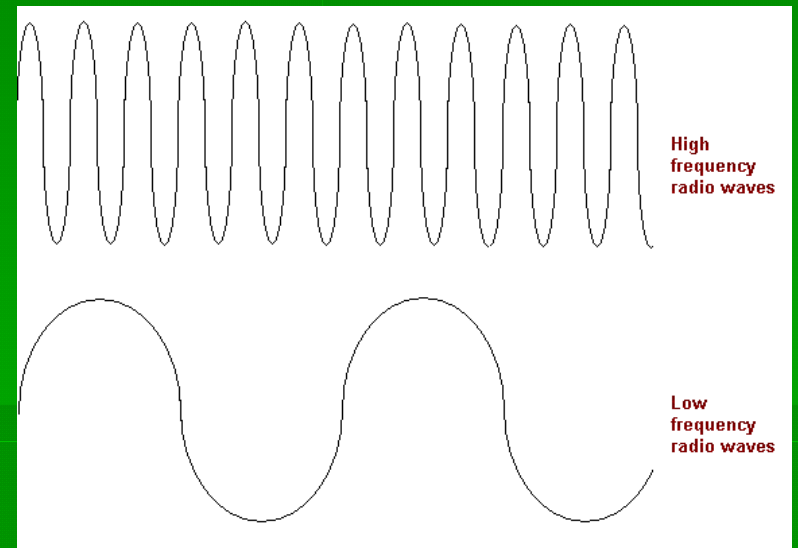
How fast does a radio wave travel through space?

- A. At the speed of light
- B. At the speed of sound
- C. Its speed is inversely proportional to its wavelength
- D. Its speed increases as the frequency increases

## T4B02 (D)

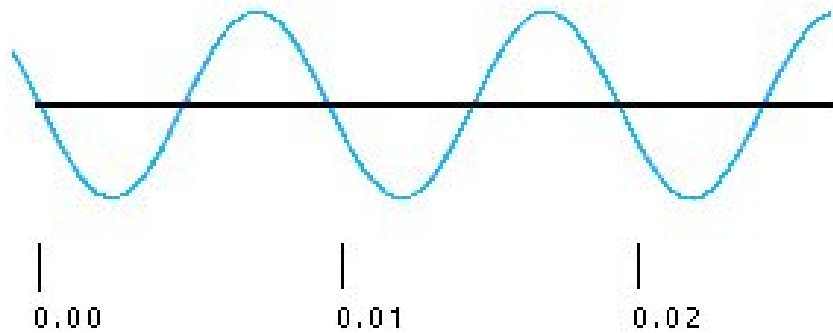
What term describes the number of times that an alternating current flows back and forth per second?

- A. Pulse rate
- B. Speed
- C. Wavelength
- D. Frequency

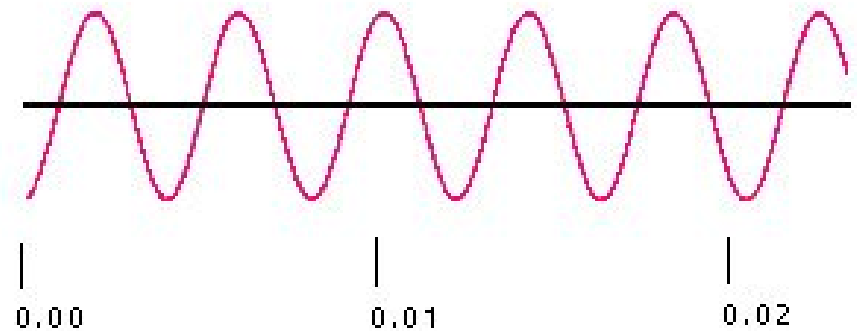


Frequency is also known as “cycles per second” or “Hertz”

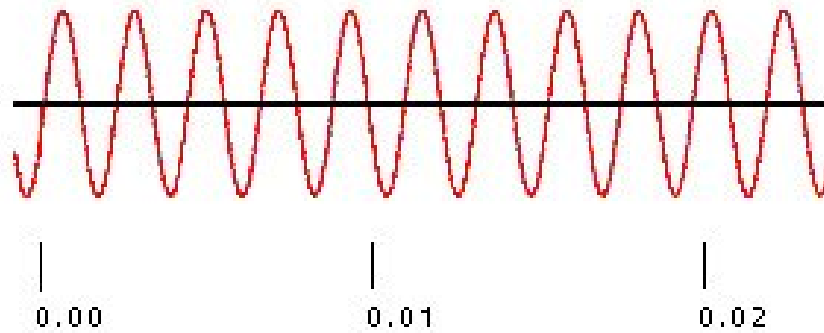
110.00 HZ



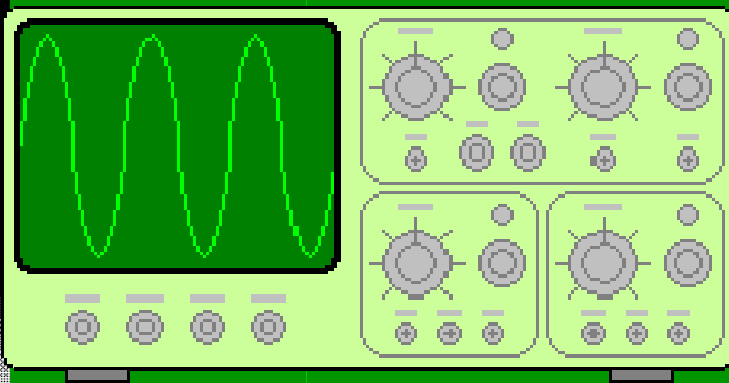
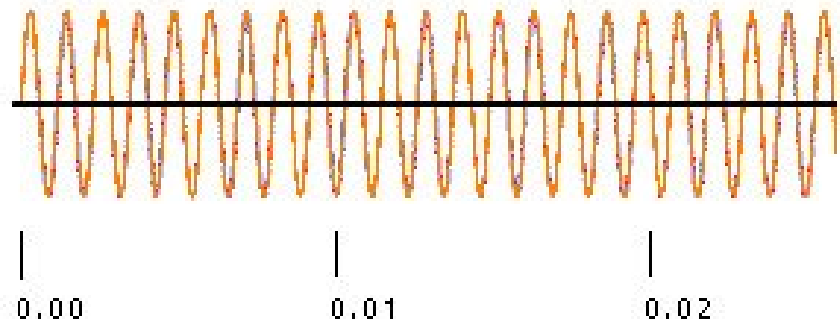
220.00 HZ



440.00 HZ



880.00 HZ



Oscilloscope  
measures frequency

T4A05 (B)

What is the standard unit of frequency?

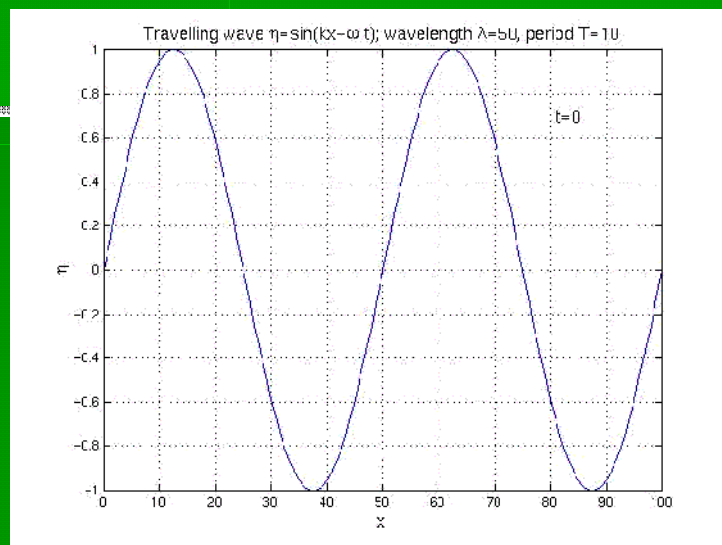
- A. The megacycle
- B. **The Hertz**
- C. One thousand cycles per second
- D. The electromagnetic force



## T4B03 (B)

What does 60 hertz (Hz) mean?

- ~~A. 6000 cycles per second~~
- B. 60 cycles per second
- C. 6000 meters per second
- D. 60 meters per second



← Cycles per Second

T4E08 (A)

What is another way to specify the frequency of a radio signal that is oscillating at 1,500,000 Hertz?

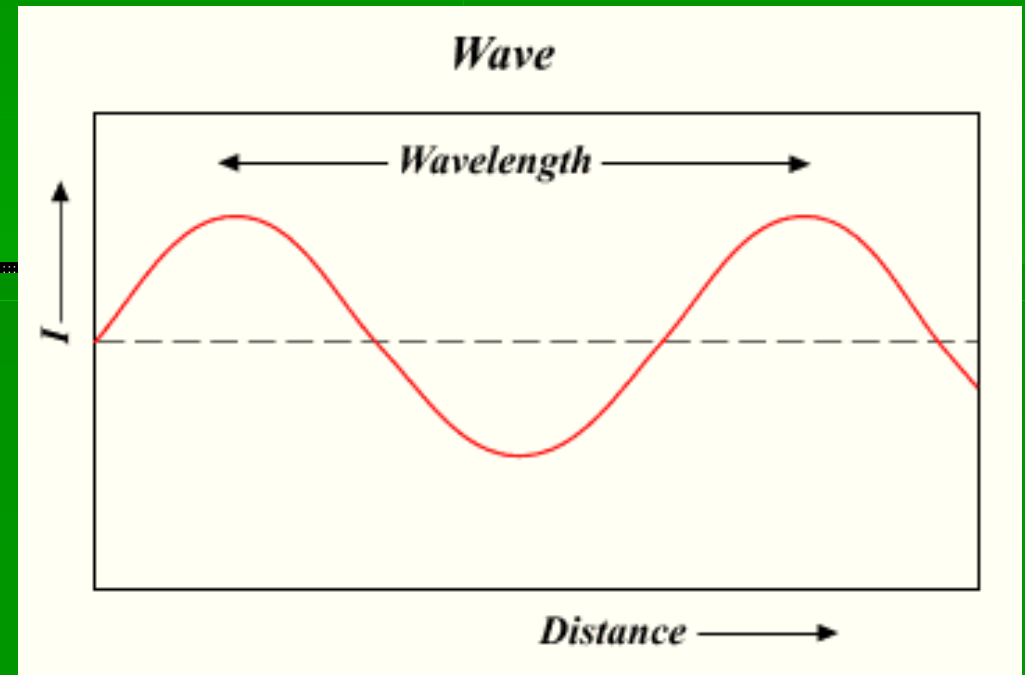
- A. 1500 kHz
- B. 1500 MHz
- C. 15 GHz
- D. 150 kHz

Kilo (K) = 1000 so  $1,500 \times 1000 = 1,500,000$   
or 1500 kHz (kilohertz)

T4B01 (C)

What is the name for the distance a radio wave travels during one complete cycle?

- A. Wave speed
- B. Waveform
- C. **Wavelength**
- D. Wave spread

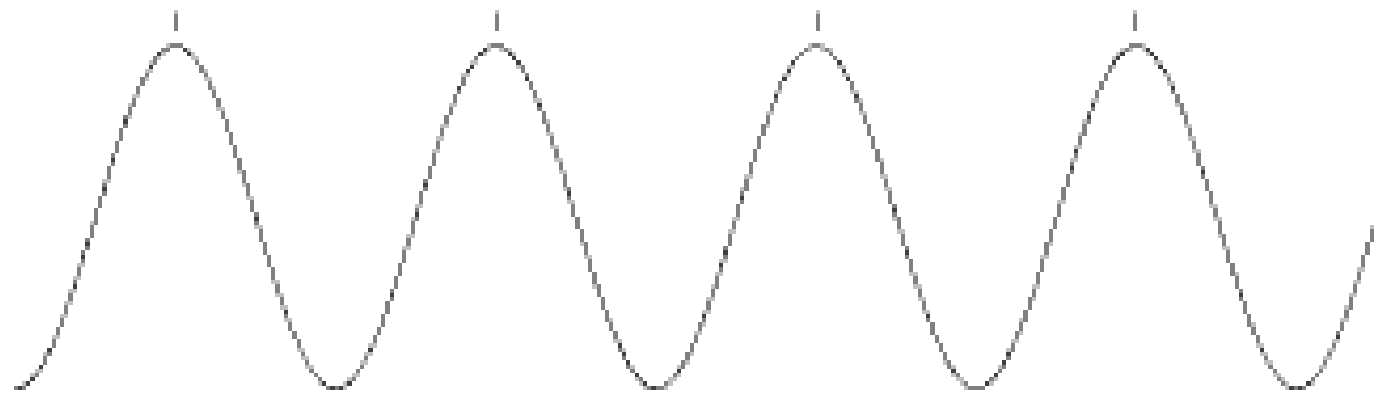


## T4B06 (B)

- How does the wavelength of a radio wave relate to its frequency?
- A. The wavelength gets longer as the frequency increases
- B. The wavelength gets shorter as the frequency increases
- C. There is no relationship between wavelength and frequency
- D. The wavelength depends on the bandwidth of the signal







Short wavelength – High frequency



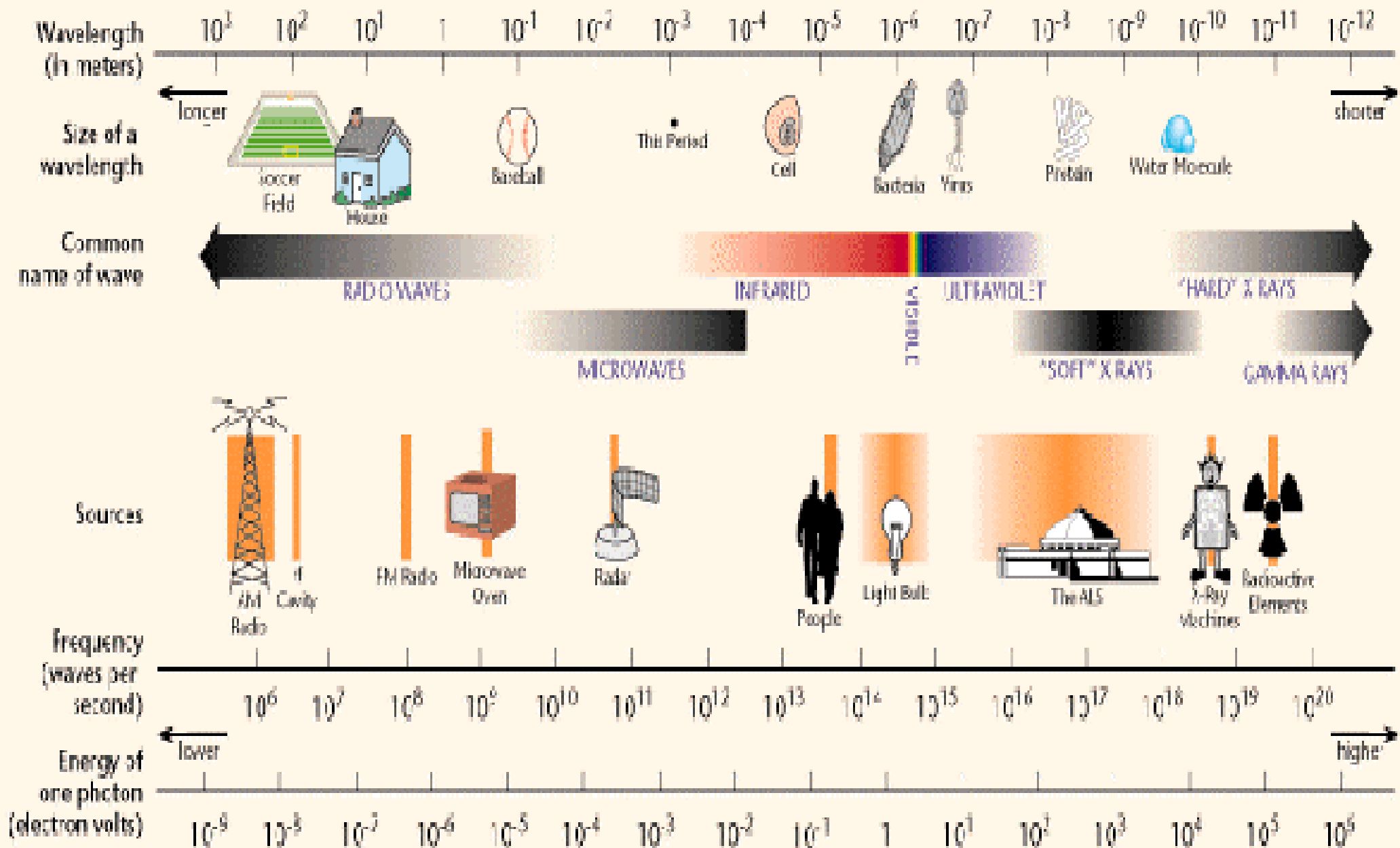
Long wavelength – Low frequency

## T4B09 (A)

What property of a radio wave is often used to identify the different bands amateur radio operators use?

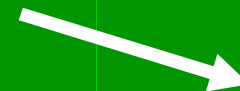
- A. The physical length of the wave
- B. The magnetic intensity of the wave
- C. The time it takes for the wave to travel one mile
- D. The voltage standing wave ratio of the wave

# THE ELECTROMAGNETIC SPECTRUM



## T4B07 (D)

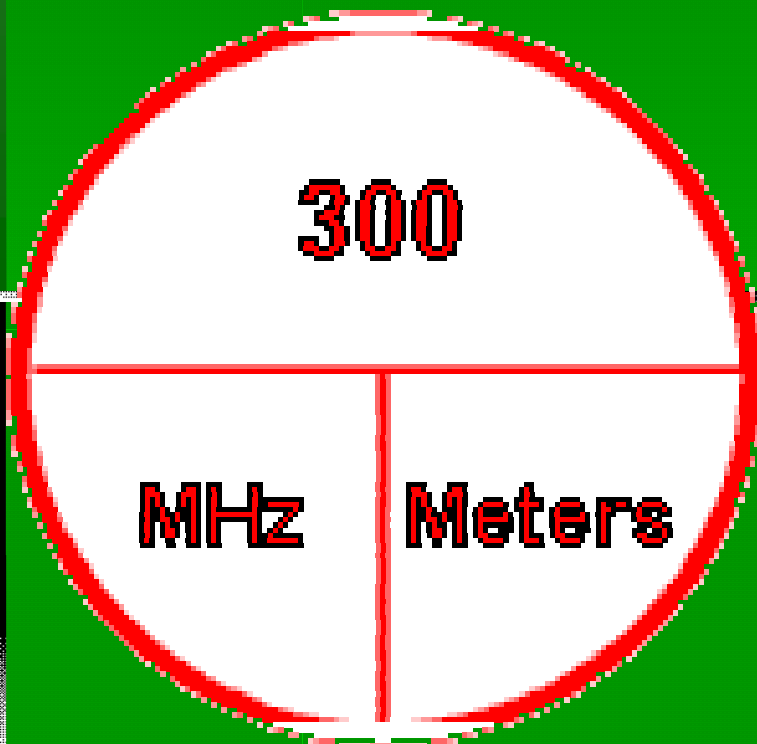
- What is the formula for converting frequency to wavelength in meters?
- A. Wavelength in meters equals frequency in Hertz multiplied by 300
- B. Wavelength in meters equals frequency in Hertz divided by 300
- C. Wavelength in meters equals frequency in megahertz divided by 300
- D. Wavelength in meters equals 300 divided by frequency in megahertz



Wavelength = 300 divided by Frequency

AND

Frequency = 300 divided by Wavelength



Remember: Its

"300 DIVIDED BY"

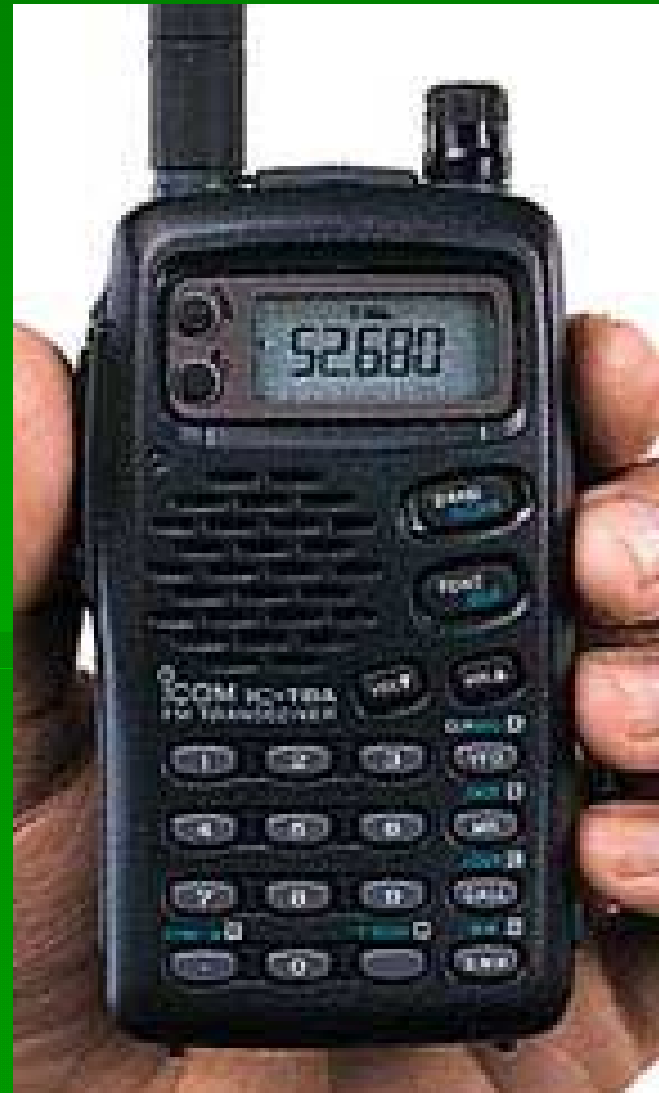
← Magic Circle!

## T4B11 (D)

What is the frequency range of the 6 meter band in the United States?

- A. 144 to 148 MHz
- B. 222 to 225 MHz
- C. 420 to 450 MHz
- D. 50 to 54 MHz

6 Meter hand  
held radio



## T1C04 (B) [97.301(a)]

Which frequency is within the 6-meter band?

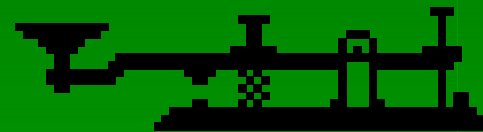
- A. 49.00 MHz
- B. 52.525 MHz
- C. 28.50 MHz
- D. 222.15 MHz



## T3B09 (A) [97.305 (a)(c)]

What emission modes are permitted in the restricted sub-band at 50.0-50.1 MHz?

- A. CW only
- B. CW and RTTY
- C. SSB only
- D. CW and SSB



-----

CQ PL CQ DE SXB / 8 MSZ K

“calling any station please  
calling from Strassbourg / 8  
Namibe go ahead”

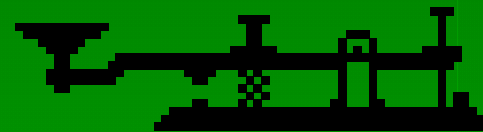
A small portion of every band is reserved for CW (code). CW uses a very narrow bandwidth. Generally, the lower portion of the band is used.



## T3B09 (A) [97.305 (a)(c)]

What emission modes are permitted in the restricted sub-band at 50.0-50.1 MHz?

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- D. CW and SSB



CQ PL CQ DE SXB / 8 MSZ K

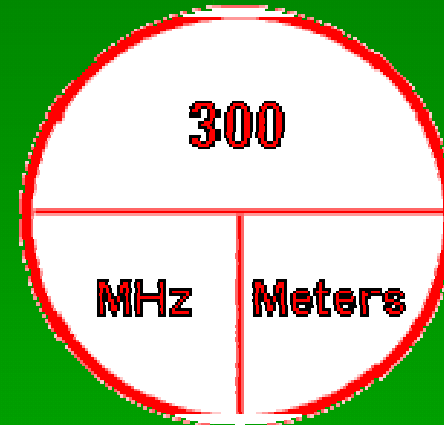
“calling any station please  
calling from Strassbourg / 8  
Namibe go ahead”

A small portion of every band is reserved for CW (code). CW uses a very narrow bandwidth. Generally, the lower portion of the band is used.

## T4B10 (A)

What is the frequency range of the 2 meter band in the United States?

- A. 144 to 148 MHz
- B. 222 to 225 MHz
- C. 420 to 450 MHz
- D. 50 to 54 MHz

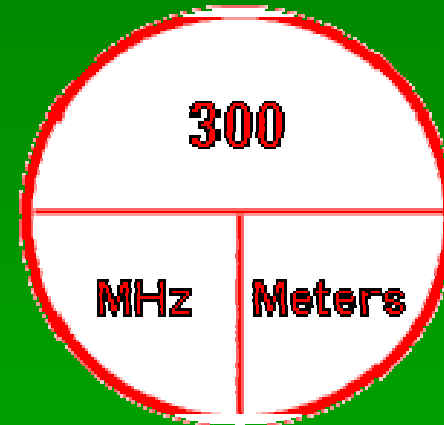


You can just commit this to memory or remember the formula 300 divided by 2 meters is about 150, so the closest answer is A.

T1C05 (A) [97.301(a)]

Which amateur band are you using when transmitting on 146.52 MHz?

- A. 2 meter band
- B. 20 meter band
- C. 14 meter band
- D. 6 meter band



Use the Magic circle. 300 divided by 146.52 is about 2.04 meters. So the closest answer is A.

## T3B10 (A) [97.305 (a)(c)]

What emission modes are permitted in the restricted sub-band at 144.0-144.1 MHz?

- A. CW only
- B. CW and RTTY
- C. SSB only
- D. CW and SSB

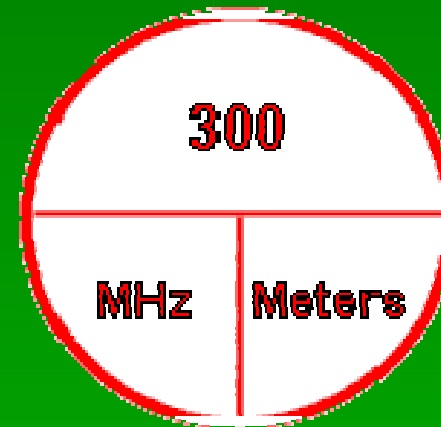
Remember with that small of a bandwidth, it must be CW!

$$144.1 - 144.0 = .1 \text{ MHz}$$

T1C08 (D) [97.301(a)]

What amateur band are you using if you are operating on 223.50 MHz?

- A. 15 meter band
- B. 10 meter band
- C. 2 meter band
- D. **1.25 meter band**



Use the Magic Circle: 300 divided by 223.50 = about 1.3 meters. So the closest answer is D.

## T6C05 (B)

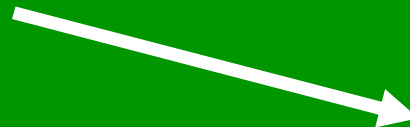
What emission mode may be used by a Technician class operator in the 219 - 220 MHz frequency range?

- A. Slow-scan television
- B. Point-to-point digital message forwarding
- C. FM voice
- D. Fast-scan television

This is 1 MHz reserved for digital message forwarding.

## ***Enhanced Digital Messaging for Amateur Radio***

The FCC has allocated 219-220 MHz to amateur use on a secondary basis. This allocation is *only* for fixed digital message forwarding systems operated by all licensees except Novices. Amateur operations must not cause interference to, and must accept interference from, primary services in this and adjacent bands. Amateur stations are limited to 50 W PEP output and 100 kHz bandwidth. Automated Maritime Telecommunications Systems (AMTS) stations are the primary occupants in this band.





Position Reports - Microsoft Internet Explorer provided by Comcast

File Edit View Favorites Tools Help

Address <http://www.winlink.org/positions/PosReports.aspx>

# Winlink! 2000 CMS

Enhanced Digital Messaging for Amateur Radio

Map Satellite Hybrid US Topo

Position Reports

Callsign	Gridsquare
9A3KG	FM14AE
AA1SA	NJ96WH
AA1XY	FL23KU
AA12L	FF35TE
AA2YS	FN13FD
AA3ZO	EL96XI
AA7AZ	DM33XT
AA7KU	FL15BJ
AA8Q	EM79XW
AB2RV	FL15IB
AD5AO	FM18TC
CT1AVZ	GJ34UU
DB4BZ	HK15OH
DC0SYB	FE74DX
DC2JB	EL91FO
DC9BMO	NJ36LL
DF8NE	JO54OK
DG4LO	JN48CW
DG6RVK	IL27CT
DG6YIK	IL28GD
DH1LAS	EL97TP
DH3HL	FE74DX
DH3MBN	JN57DM
DK1ZZ	JN58KI
DK5BF	RF82CH
DL2XAT	HI73MA
DL2ZJ	IL28XE
DL5DI	JO30QJ
DL6CE	FK94MB
DL6JG	JN12NG
DL6KAC	EK09JL
DL7AQL	QH90FC
DL8HB	IL00IJ
DL8MAX	JO31JI
EA8AYT	IL28GD
F4DRX	IL15XU
F4ERF	HJ65FS
F4EUT	IL28GD
F5JSD	JN08VW
F9FJ	FK20FJ
F9IB	JN23BN
FM5FZ	BH52EJ
G0VNP	IO90IS
GU0NHD	RF74CR
GW0IJF	GJ62BG

POWERED BY Google

2000 mi  
2000 km

Terms of Use

Wed, 21 Dec 2005 04:54:46 UTC

Internet



## T3B08 (C) [97.305(c)]

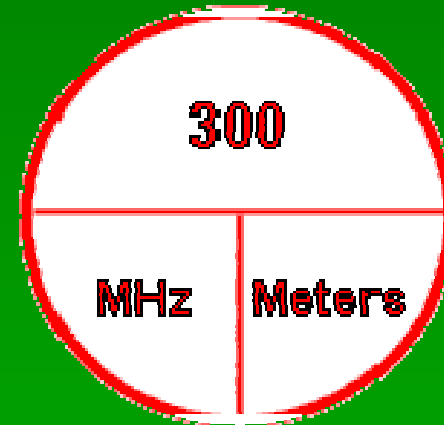
Which of the bands available to Technician class licensees have mode restricted sub-bands?

- A. The 6-meter, 2-meter, and 70-centimeter bands
- B. The 2-meter and 13-centimeter bands
- C. The 6-meter, 2-meter, and 1 1/4-meter bands
- D. The 2-meter and 70-centimeter bands

## T4B12 (C)

What is the frequency range of the 70 centimeter band in the United States?

- A. 144 to 148 MHz
- B. 222 to 225 MHz
- C. 420 to 450 MHz
- D. 50 to 54 MHz



100 centimeters = 1 meter

70 centimeters = .7 meter

Use the Magic circle: 70 centimeters is .70 meters, so 300 divided by .70 is about 428.57 MHz. the closest answer is C. Remember to change centimeters into meters first!

T1C06 (C) [97.301(a)]

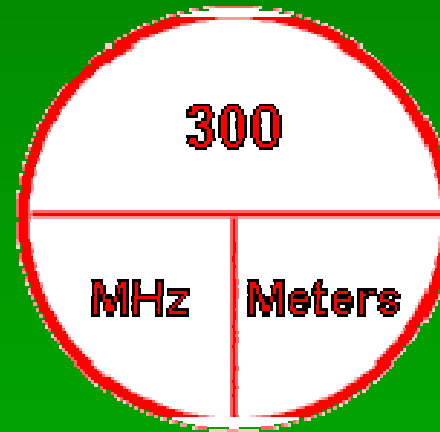
Which 70-centimeter frequency is authorized to a Technician class license holder operating in ITU Region 2?

- A. 455.350 MHz
- B. 146.520 MHz
- C. **443.350 MHz**
- D. 222.520 MHz

T1C07 (B) [97.301(a)]

Which 23 centimeter frequency is authorized to a Technician class license holder operating in ITU Region 2?

- A. 2315 MHz
- B. 1296 MHz
- C. 3390 MHz
- D. 146.52 MHz



23 cm = .23 meter

Use the Magic Circle: 300 divided by .23 meter is 1304 MHz. The closest answer is B.

# Your First Radio (p. 70)

T4C02 (A)

What is used to convert sounds from our voice into radio signals?

- A. **Transmitter**
- B. Receiver
- C. Speaker
- D. Antenna



## T5A01 (B)

What does a microphone connect to in a basic amateur radio station?

- A. The receiver
- B. **The transmitter**
- C. The SWR Bridge
- D. The Balun

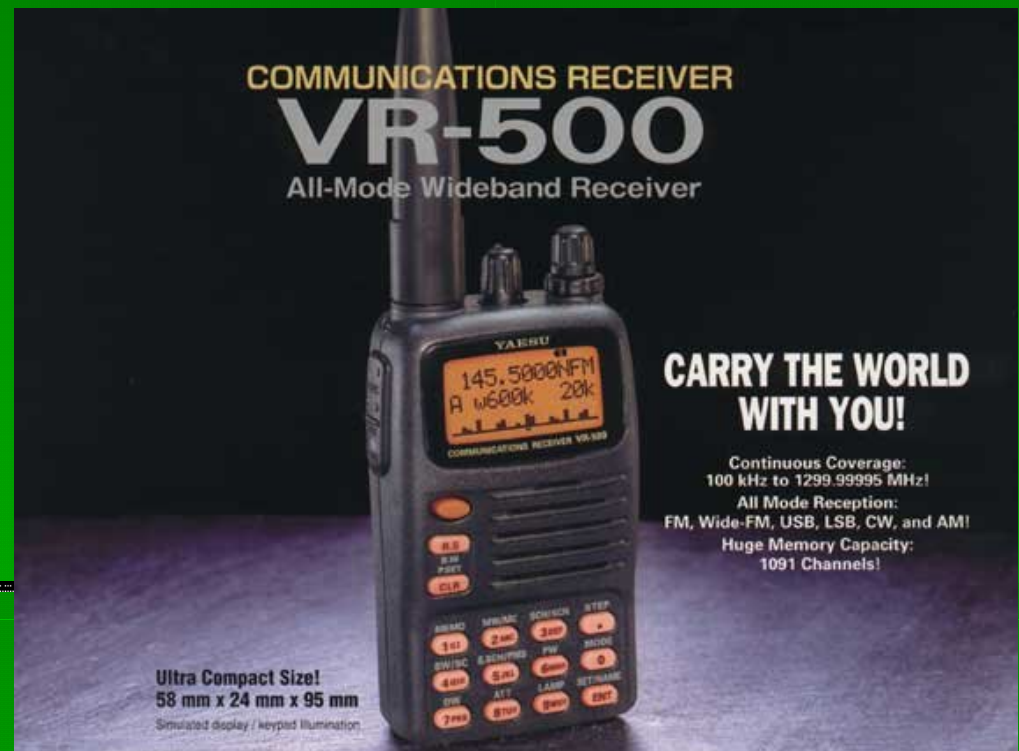


Microphone connects to transmitter here

# T4C01 (B)

What is used to convert radio signals into sounds we can hear?

- A. Transmitter
- B. **Receiver**
- C. Microphone
- D. Antenna



## T5A02 (C)

Which piece of station equipment converts electrical signals to sound waves?

- A. Frequency coordinator
- B. Frequency discriminator
- C. **Speaker**
- D. Microphone

Communications  
speaker





## T4C03 (A)

What two devices are combined into one unit in a transceiver?

- A. Receiver, transmitter
- B. Receiver, transformer
- C. Receiver, transistor
- D. Transmitter, deceiver



T5A04 (C)

What could you use in place of a regular speaker to help you copy signals in a noisy area?

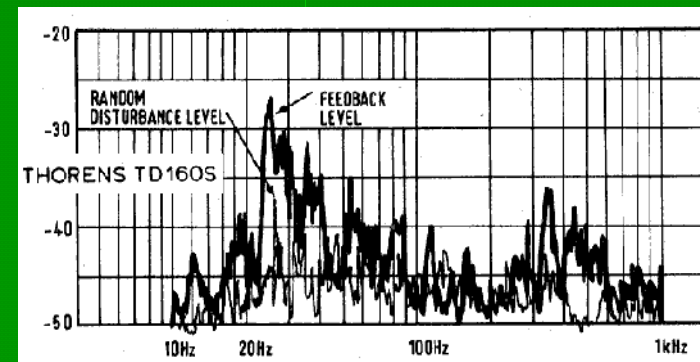
- A. A video display
- B. A low pass filter
- C. **A set of headphones**
- D. A boom microphone



## T5A03 (B)

What is the term used to describe what happens when a microphone and speaker are too close to each other?

- A. Excessive wind noise
- B. **Audio feedback**
- C. Inverted signal patterns
- D. Poor electrical grounding



## T5B01 (B)

What may happen if a transmitter is operated with the microphone gain set too high?

- A. The output power will be too high
- B. It may cause the signal to become distorted and unreadable
- C. The frequency will vary
- D. The SWR will increase

Microphone gain control



## T5B03 (A)

What is one way to select a frequency on which to operate?

- A. Use the keypad or VFO knob to enter the correct frequency
- B. Turn on the CTCSS encoder
- C. Adjust the power supply ripple frequency
- D. All of these answers are correct

## T5B05 (B)

What is a way to enable quick access to a favorite frequency on your transceiver?

- A. Enable the CTCSS tones
- B. Store the frequency in a memory channel
- C. Disable the CTCSS tones
- D. Use the scan mode to select the desired frequency

## T5B02 (D)

What kind of information may a VHF/UHF transceiver be capable of storing in memory?

- A. Transmit and receive operating frequency
- B. CTCSS tone frequency
- C. Transmit power level
- D. All of these answers are correct

## T5B07 (A)

What is the purpose of the buttons labeled "up" and "down" on many microphones?

- A. To allow easy frequency or memory selection
- B. To raise or lower the internal antenna
- C. To set the battery charge rate
- D. To upload or download messages



## T5B10 (D)

What is the purpose of the "step" menu function found on many transceivers?

- A. It adjusts the transmitter power output level
- B. It adjusts the modulation level
- C. It sets the earphone volume
- D. It sets the tuning rate when changing frequencies

## T5B08 (C)

What is the purpose of the "shift" control found on many VHF/UHF transceivers?

- A. Adjust transmitter power level
- B. Change bands
- C. Adjust the offset between transmit and receive frequency
- D. Change modes

Used to offset the input frequency to a repeater.

## T5B11 (C)

What is the purpose of the "function" or "F" key found on many transceivers?

- A. It turns the power on and off
- B. It selects the autopatch access code
- C. It selects an alternate action for some control buttons
- D. It controls access to the memory scrambler

## T5B04 (D)

What is the purpose of the squelch control on a transceiver?

- A. It is used to set the highest level of volume desired
- B. It is used to set the transmitter power level
- C. It is used to adjust the antenna polarization
- D. It is used to quiet noise when no signal is being received

# T5B09 (B)

What does RIT mean?

- A. Receiver Input Tone
- B. Receiver Incremental Tuning
- C. Rectifier Inverter Test
- D. Remote Input Transmitter

RIT control





Can you find the “up” and “down” controls, the Squelch control, the Shift control, and the RIT control on this transceiver? The tuning Step control?



## T5B06 (C)

What might you do to improve the situation if the station you are listening to is hard to copy because of ignition noise interference?

- A. Increase your transmitter power
- B. Decrease the squelch setting
- C. Turn on the noise blanker
- D. Use the RIT control



Noise Blanker



## T7A01 (C)

What is a good thing to have when operating a hand-held transceiver away from home?

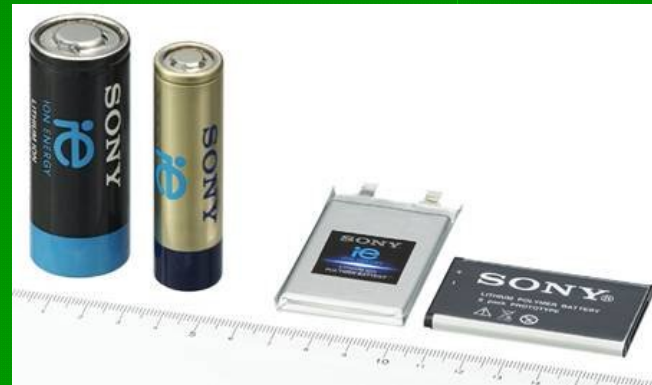
- A. A selection of spare parts
- B. A programming cable to load new channels
- C. One or more fully charged spare battery packs
- D. A dummy load

See ham note on page 75

## T4C06 (D)

Which of the battery types listed below offers the longest life when used with a hand-held radio, assuming each battery is the same physical size?

- A. Lead-acid
- B. Alkaline
- C. Nickel-cadmium
- D. **Lithium-ion**



## T4C09 (D)

What is required to keep rechargeable batteries in good condition and ready for emergencies?

- A. They must be inspected for physical damage and replaced if
  - necessary
- B. They should be stored in a cool and dry location
- C. They must be given a maintenance recharge at least every 6
  - months
- D. All of these answers are correct

## T4C08 (B)

What battery type on this list is not designed to be re-charged?

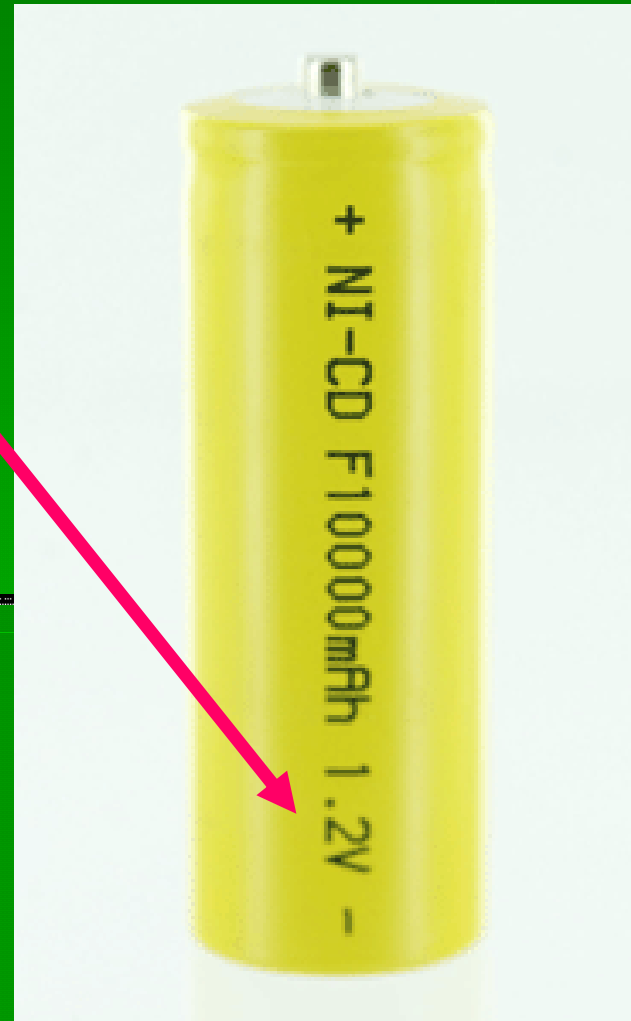
- A. Nickel-cadmium
- B. **Carbon-zinc**
- C. Lead-acid
- D. Lithium-ion



## T4C07 (B)

What is the nominal voltage per cell of a fully charged nickel-cadmium battery?

- A. 1.0 volts
- B. 1.2 volts
- C. 1.5 volts
- D. 2.2 volts



## T4C10 (B)

What is the best way to get the most amount of energy from a battery?

- A. Draw current from the battery as rapidly as possible
- B. Draw current from the battery at the slowest rate needed
- C. Reverse the leads when the battery reaches the 1/2 charge level
- D. Charge the battery as frequently as possible

Use lowest transmit power necessary!

## T0A09 (C)

What is one way to recharge a 12-volt battery if the commercial power is out?

- A. You cannot recharge a battery unless the power is back on
- B. Add water to the battery
- C. Connect the battery to a car's battery and run the engine
- D. Take your battery to the utility company for a recharge

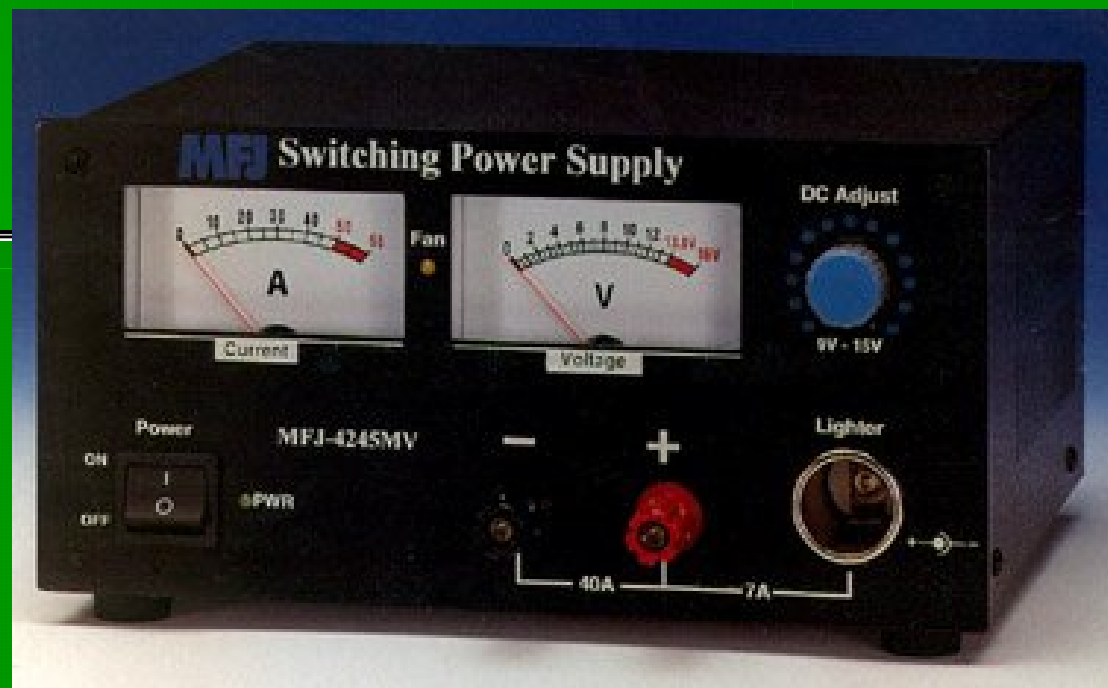
## T5A05 (A)

What is a good reason for using a regulated power supply for communications equipment?

- A. To protect equipment from voltage fluctuations
- B. A regulated power supply has FCC approval
- C. A fuse or circuit breaker regulates the power
- D. Regulated supplies are less expensive



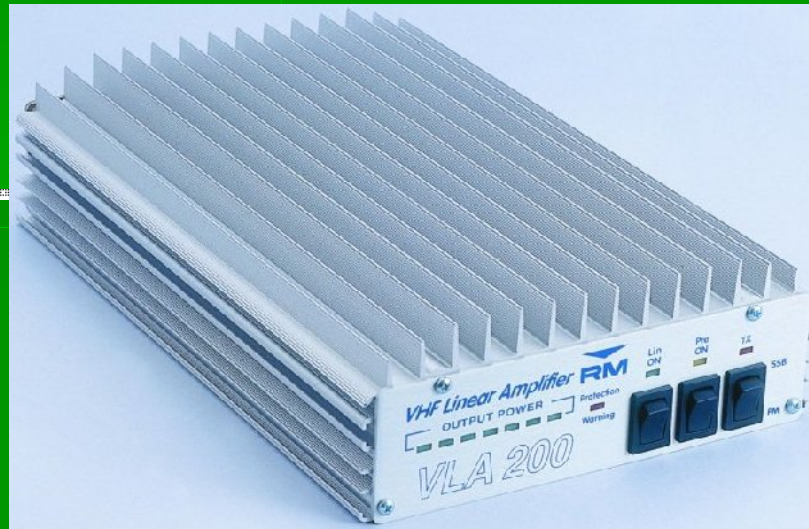
# Power Supplies



T4C05 (A)

What device is used to increase the output of a 10 watt radio to 100 watts?

- A. **Amplifier**
- B. Power supply
- C. Antenna
- D. Attenuator



# Linear Amplifiers

# Going On the Air! (p.79)

- T3A01 (B)

Which of the following should you do when selecting a frequency on which to transmit?

- A. Call CQ to see if anyone is listening
- B. Listen to determine if the frequency is busy
- C. Transmit on a frequency that allows your signals to be heard
- D. Check for maximum power output

## T7A07 (A)

What is a popular operating activity that involves contacting as many stations as possible during a specified period of time?

- A. **Contesting**
- B. Net operations
- C. Public service events
- D. Simulated emergency exercises





GERC hams contesting on the  
ARRL Field Day, June 2006

## T3A03 (A)

How do you indicate you are looking for any station with which to make contact?

- A. **CQ followed by your callsign**
- B. RST followed by your callsign
- C. QST followed by your callsign
- D. SK followed by your callsign

CQ, CQ, CQ this is KF6DSA calling CQ.

CQ, CQ, CQ this is Kilowatt Foxtrot Six  
Delta Sierra Alpha calling CQ

## T3A08 (D)

What is the meaning of the procedural signal "CQ"?

- A. Call on the quarter hour
- B. New antenna is being tested (no station should answer)
- C. Only the called station should transmit
- D. **Calling any station**

We don't call CQ on the fm repeater or simplex bands, since your signal will be heard!  
For example say: "KG6TPU monitoring"



## T3C03 (A)

What should you do before responding to another stations call?

- A. Make sure you are operating on a permissible frequency for your license class
- B. Adjust your transmitter for maximum power output
- C. Ask the station to send their signal report and location
- D. Verify the other station's license class

## T3A04 (C)

What should you transmit when responding to a call of CQ?

- A. Your own CQ followed by the other station's callsign
- B. Your callsign followed by the other station's callsign
- C. The other station's callsign followed by your callsign
- D. A signal report followed by your callsign

## T3A10 (B)

What brief statement is often used in place of "CQ" to indicate that you are listening for calls on a repeater?

- A. Say "Hello test" followed by your call sign
- B. **Say your call sign**
- C. Say the repeater call sign followed by your call sign
- D. Say the letters "QSY" followed by your call sign

## T3C01 (A)

What is the proper way to break into a conversation between two stations that are using the frequency?

- A. Say your call sign between their transmissions
- B. Wait for them to finish and then call CQ
- C. Say "Break-break" between their transmissions
- D. Call one of the operators on the telephone to interrupt the conversation

Never say "break" unless it is an emergency! <sup>188</sup>

## T3C04 (C) [97.101(b)]

What rule applies if two amateur stations want to use the same frequency?

- A. The station operator with a lesser class of license must yield the frequency to a higher-class licensee
- B. The station operator with a lower power output must yield the frequency to the station with a higher power output
- C. No frequency will be assigned for the exclusive use of any station and neither has priority
- D. Station operators in ITU Regions 1 and 3 must yield the frequency to stations in ITU Region 2

Always be courteous and you won't have any problems!

- T3C07 (C)

What should you do if you hear a newly licensed operator that is having trouble with their station?

- A. Tell them to get off the air until they learn how operate properly
- B. Report them to the FCC
- C. Contact them and offer to help with the problem
- D. Move to another frequency

## T7A04 (C)

What would be a good thing to have when operating from a location that includes lots of crowd noise?

- A. A portable bullhorn
- B. An encrypted radio
- C. A combination headset and microphone
- D. A pulse noise blanker



T8B09 (C)

Why should casual conversation between stations during a public service event be avoided?

- A. Such chatter is often interesting to bystanders
- B. Other listeners might overhear personal information
- C. Idle chatter may interfere with important traffic
- D. You might have to change batteries more often



## T3C10 (C) [97.101 (a)]

When circumstances are not specifically covered by FCC rules what general operating standard must be applied to amateur station operation?

- A. Designated operator control
- B. Politically correct control
- C. Good engineering and amateur practices
- D. Reasonable operator control

## T3D06 (D)

Who has exclusive use of a specific frequency when the FCC has not declared a communication emergency?

- A. Any net station that has traffic
- B. The station first occupying the frequency
- C. Individuals passing health and welfare communications
- D. No station has exclusive use of any frequency

## T3B01 (A)

What is a band plan?

- A. A voluntary guideline, beyond the divisions established by the FCC for using different operating modes within an amateur band
- B. A guideline from the FCC for making amateur frequency band allocations
- C. A guideline for operating schedules within an amateur band published by the FCC
- D. A plan devised by a local group

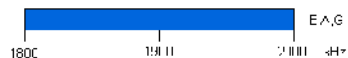
# US Amateur Bands

April 15, 2000

## Novice, Advanced and Technician Plus Allocations

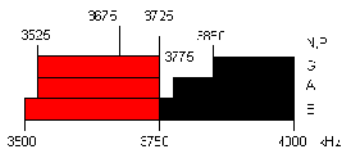
Novice, Advanced and Technician Plus licenses will not be issued after April 15, 2000. However, the FCC has allowed the frequency allocations for these license classes to remain in effect.

### 160 METERS



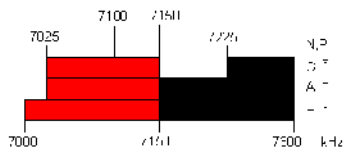
Amateur stations operating at 1800-2000 kHz must not cause harmful interference to the allocation service and are afforded no protection from that allocation operation.

### 80 METERS



5167.5 kHz (SSB only); Alaska emergency use only.

### 40 METERS



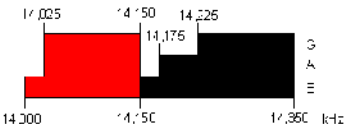
\* Phone and image modes are permitted between 7100 and 7150 kHz for FCC licensed stations in ITU Regions 1 and 2 and by FCC licensed stations in ITU Region 2 who are within 100 km of the US/Canada border. South of 20 degrees North latitude, see Sec. 97.305(c) and 97.307(d). Novice and Technician Plus licensees outside the US/Canada border may use CW only between 7100 and 7150 kHz. See Section 97.301(e). These exemptions do not apply to stations in the continental US.

### 30 METERS



Maximum power on 30 meters is 200 watts PEP output. Amateurs must avoid interference to the fixed service outside the US.

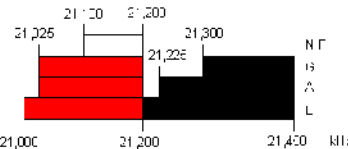
### 20 METERS



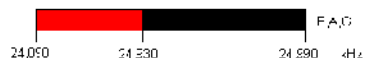
### 17 METERS



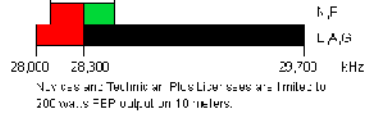
### 15 METERS



### 12 METERS



### 10 METERS



Novice and Technician Plus licensees are limited to 200 watts PEP output on 10 meters.

### 6 METERS



### 2 METERS



### 1.25 METERS



Novices are limited to 25 watts PEP output from 222.0 to 225 MHz.

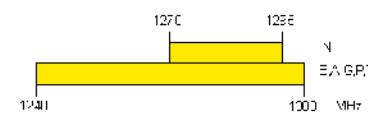
### 70 CENTIMETERS



### 33 CENTIMETERS



### 23 CENTIMETERS



Novices are limited to 1 watt PEP output from 1270 to 1295 MHz.

## US AMATEUR POWER LIMITS

At all times, transmitter power should be kept down to that necessary to carry on the desired communications. Power is rated in watts PEP output. Unless otherwise stated, the maximum power output is 1500 W. Power for all license classes is limited to 200 W in the 1.2, 6, 10, 15, 17, 20, 30, 40, 80, and 160 MHz bands and in all VHF and UHF subbands below 28.1 MHz. Novice and Technician Plus licensees are restricted to 200 W in the 28.1-29.7 MHz subband. Additionally, Novice and Technician Plus licensees are restricted to 25 W in the 222-225 MHz band and 5 W in the 1.2-1.25 MHz subband.

Operators with Technician class licenses and above may operate on all bands above 50 MHz. For more details in information see The FCC Rule Book.

- KEY**
- Red = CW, RTTY, and data
  - Yellow = CW, RTTY, data, MCM, net, phone and image
  - Black = CW, phone and image
  - Green = CW and phone
  - Blue = CW, RTTY, data, phone, and image
  - White = CW only
- N = NOVICE  
T = TECHNICIAN  
G = GENERAL  
A = ADVANCED  
E = EXTRA CLASS  
P = TECHNICIAN PLUS

\*\* Geographical and power restrictions apply to these bands. See The FCC Rule Book for more information about your area.

Above 30 Centimeters:

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

- 2200-2210 MHz
- 2300-2450 MHz
- 3000-3500 MHz
- 5600-5825 MHz
- 6000-10.5 GHz
- 24.0-24.25 GHz
- 47.0-47.2 GHz
- 76.5-81.0 GHz
- 119.58-120.02 GHz
- 142-149 GHz
- 241-250 GHz

All above 100 GHz



For band plans and sharing arrangements, see The FCC Rule Book.

Refer to your copy of this US Amateur Band Plan

## T8C06 (C)

What is of primary importance for a net control station?

- A. A dual-band transceiver
- B. A network card
- C. **A strong and clear signal**
- D. The ability to speak several languages

Usually the Net control station has more power than the hand held radios, etc.

## T6C08 (C)

What sending speed is recommended when using Morse code?

- A. Only speeds below five WPM
- B. The highest speed your keyer will operate
- C. Any speed at which you can reliably receive
- D. The highest speed at which you can control the keyer

T6C10 (A)

What is the "Q" signal used to indicate that you are receiving interference from other stations?

- A. **QRM**
- B. QRN
- C. QTH
- D. QSB

T6C11 (B)

What is the "Q" signal used to indicate that you are changing frequency?

- A. QRU
- B. QSY
- C. QSL
- D. QRZ



## T2D07 (C) [97.11(a)]

When may you operate your amateur station aboard an aircraft?

- A. At any time
- B. Only while the aircraft is on the ground
- C. Only with the approval of the pilot in command and not using the aircraft's radio equipment
- D. Only when you have written permission from the airline and only using the aircraft's radio equipment

You will rarely get permission to transmit on an aircraft!

## T2B09 (A) [97.119(4)(c)]

What is required when using one or more self-assigned indicators with your assigned call sign?

- A. The indicator must not conflict with an indicator specified by FCC rules or with a prefix assigned to another country
- B. The indicator must consist only of numeric digits
- C. The indicator must include the 2-letter abbreviation for your state
- D. The indicator must be separated from your call sign by a double slash mark

These are called “tactical” call signs. Example. “station one”, etc.

## T2A11 (C) [97.113(a)3]

When may you use your station to tell people about equipment you have for sale?

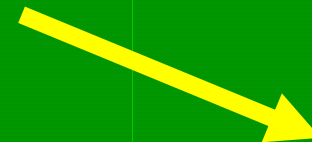
- A. Never
- B. When you are conducting an on-line auction
- C. When you are offering amateur radio equipment for sale or trade on an occasional basis
- D. When you are helping a recognized charity

## T7A06 (B)

Which of these items would be the most useful for a hidden transmitter hunt?

- A. Binoculars and a compass
- B. **A directional antenna**
- C. A calibrated noise bridge
- D. Calibrated SWR meter

This is also known as Radio Direction Finding,  
T-hunting, or Fox hunting.





Can you see  
this hidden  
transmitter?

“Fox” hunting is  
a fun sport !



# End of First CD







