Tech License Class Agenda

Week 1 / Day 1– September 25, 2018

Week 1 / Day 2 – September 27, 2018

Week 2 / Day 1– October 2, 2018

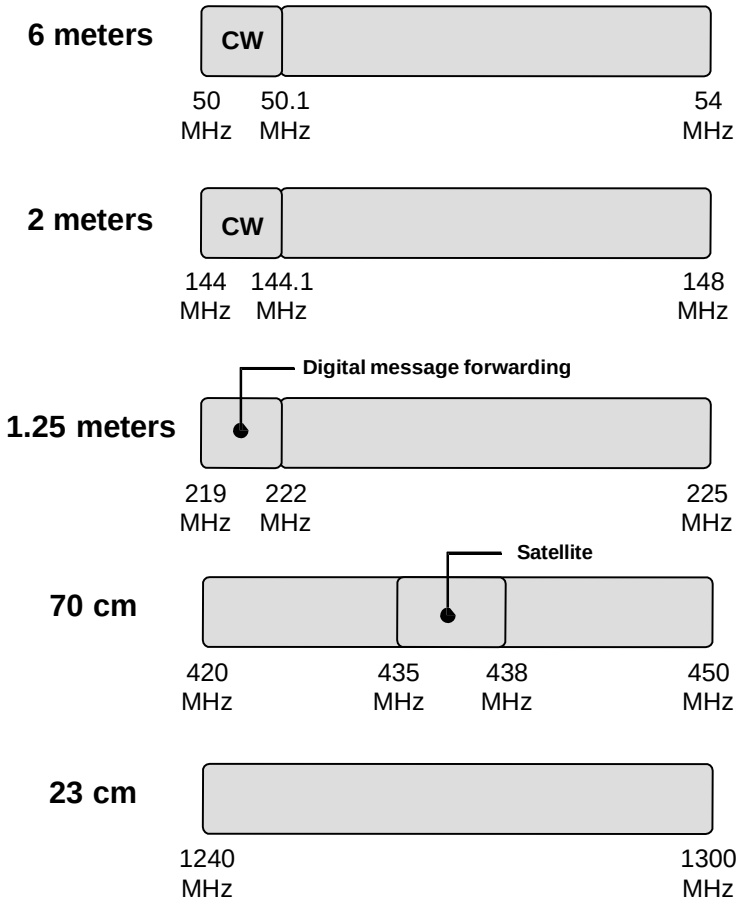
Week 2 / Day 2 – October 4, 2018

Week 3 / Day 1 – October 9, 20178

Week 3 / Day 2 – October 11, 2018

Review and Test

Technician License Memory Aid



1. Always use the lowest power that will provide reliable communications.
2. Always identify using your callsign
   - At the end of every exchange
   - Every 10 minutes
3. In case of interference (to you or others), first be sure your station equipment is operating correctly.
4. The FCC makes and enforces the rules, and issues licenses for the Amateur Radio Service.
5. Once your name and callsign are in the FCC ULS database, you can operate a ham radio.
6. US Amateur callsigns begin with A, K, N and W (*Alaska is in the Northwest:* AK NW)
7. Always listen before transmitting.
8. Use a dummy load when testing your transmitter to minimize interference.

OHM'S LAW

V = Voltage in **Volts**
A = Current in **Amperes**
O = Resistance in **Ohms**

POWER

W = Power in **Watts**
A= Current in **Amperes**
V = Voltage in **Volts**

WAVELENGTH

W = **Wavelength** in Meters
F = **Frequency** in Megahertz

¼ WAVE ANTENNA

$$\text{Length (feet)} = \frac{234}{\text{Frequency (MHz)}}$$

Multiply the length in feet by 12 to get the length in inches

A DIPOLE is twice as long, (1/2 wave) so double the length.

9. Emergency communications take priority over all others.
   - "Mayday" on voice (phone)
   - "SOS" using Morse Code (CW)
10. Kilo = One Thousand
    Mega = One Million
    Milli = One one-thousandth (.001)
    Micro = One one-millionth (.000001)

Provide by Hurst Amateur Radio Club

Gordon West, WB6NOA & The W5YI Group

Technician Class Home-Study Q & A Course, valid 2018 - 2022

Welcome to ham radio! Your classroom instructor and I have some exciting training lined up for you, with lots of live-action amateur radio excitement ahead! We really want you to have a successful study experience, as you prepare for your FCC Technician Class exam.

When you pass your exam, you'll receive your first amateur radio license and FCC call sign. By studying our yellow cover ***TECHNICIAN CLASS*** book, listening to the audio CD, and using this Home-Study material, you'll be ready to get on the air faster than you think!

I encourage you to get a head start on class with this home study course. Go through selected sections of the book with this course before each classroom session. These home study quizzes closely follow the book, and I even include page numbers to guide you to the correct answers!

If you are studying on your own, first play the audio CD inside the front cover of your book, and then begin working the book and this home study together. I am YOUR personal instructor!

The questions in this pre-study are in a casual, fill-in-the-blank format. Your actual Technician Class FCC Element 2 exam will be multiple choice as shown in your book, which makes it all that much easier! You'll likely spot the correct answer in a nanosecond!

We list some of my additional training resources in the back of this booklet. You may obtain them from The W5YI Group to help you prepare for your upcoming exam. Call during the day, 1-800 669-9594. Be sure to tell them you're working with my home-study training materials.

So, open my ***Technician Class*** book, play the included audio CD, and begin this fun home-study toward earning your first amateur radio license! Play that CD first!

I come with the book as your personal instructor via phone or E mail! If you have any questions, or don't understand a concept, or simply want my personal words of encouragement, call me at 714-549-5000 Monday - Thursday, between 10 am and 4 pm California time, and let's talk ham radio! You can also email me for help at WB6NOA@ARRL.NET

Once again, welcome to Ham Radio!

Gordon West, WB6NOA

GETTING INTO HAM RADIO *(pages 1~4)*

These questions from the beginning chapters of the book won't be on the test, but file these "factos" in your grey matter to become a great HAM radio operator. No, we have no clue where the word HAM came from, so if YOU know, let ME know! So take out your trusty pen or pencil, and write in on these lines what YOU think is the correct answer!

1. How many ham radio operators are there in the world? _____ p. 1
2. How many ham operators in the USA? _____ p. 1
3. Which organization will issue your USA amateur radio license? _____ p. 1
4. How many questions will be on your upcoming Technician Class exam? _____ p. 1
5. Popular choice for a new handheld radio has how many bands? _____ p. 2
6. Could you use a CB antenna on 10 meters? _____ p. 3
7. You can bounce a signal off this object in outer space! _____ p. 3
8. Ham radio live color TV is called? _____ p. 3
9. Ham radio is a hobby, but most important, ham radio is a _____ p. 4
10. A fellow ham to show you the ropes is called a what? _____ p. 4
11. We hope you will join this organization: _____ p. 4

TECHNICIAN CLASS PRIVILEGES *(pages 5~20)*

1. How fast do radio waves travel? Approximately _____ p. 5
2. What is the frequency range for High Frequency? _____ p. 6
3. What is the frequency range for VHF? _____ p. 6
4. What is the frequency range for UHF? _____ p. 6
5. You have long-range sky wave privileges on these HF bands? _____ p. 8
6. What is the 6 meter domestic SSB calling frequency? _____ p. 9
7. What are the upper and lower frequency limits on 2 meters? _____ p. 10
8. What is the wavelength of the 222 MHz band? _____ p. 11
9. What are the frequency limits on the 70 cm band? _____ p. 12
10. What are the frequency limits of ATV Channel 2, 23 cm band? _____ p. 13
11. What are the 4 High Frequency Technician Class bands? _____ p. 14
12. What is another name for CW? _____ p. 14
13. In addition to Morse code, 10 meter privileges include long range _____ p. 15
14. What is the frequency range of voice privileges on 10 meters? _____ p. 16
15. The free CD that comes with the book, play it _____ p. 17
16. Above what frequency are ham bands shared with other services? _____ p. 18
17. Ask your exam team how to join a local _____ p. 19
18. Soon, we hope, technician class operators will gain added long range _____ p. 20

A LITTLE HAM HISTORY *(pages 21~26)*

1. Ham radio promotes international _____ p. 21
2. When did ham radio licensing begin? _____ p. 22
3. What test requirement has been eliminated for a ham radio license? _____ p. 22
4. When did volunteer examiners take over administering ham exams? _____ p. 23
5. What are the 3 grades of current ham radio licenses? _____ p. 24
6. Can you jump over Technician to go direct to General without the tech test? _____ p. 24

7. How many examiners are required to give ham radio exams? _____p. 25
8. Which Exam Element for the Technician Class exam? _____p. 25
9. Which application form will you complete at the exam site? _____p. 25
10. Long expired licenses may be earned back by passing the technician exam? _____p. 26
11. Call this number for old-license information for grandfather information: 1-800-_____p. 26

GETTING READY FOR THE EXAM *(pages 27~32)*

1. How many questions on the Technician Class exam? _____p. 27
2. How many total questions in the Technician Class question pool? _____p. 27
3. What is the passing grade for the Element 2 exam? _____p. 27
4. How often are question pools for each element revised? Every _____p. 27
5. May the question wording be changed or modified? _____p. 28
6. How many questions can you get from Sub element T1 Rules? _____Table 4-1, p. 28
7. In this book, the total question pool has been logically _____p. 30
8. What color are the key words to study before the exam? _____p. 31
9. The complete cross reference list of Q&As is found on which pages? _____p. 31
10. Our rearrangement of Q&As begins with which topic? _____p. 32
11. We finish by covering which important aspect of ham radio? _____p. 32
12. What is Gordo's phone number if you have questions? 1-714 549-5000 _____ p.32

NOW, ON TO THE QUESTIONS FOUND IN THE BOOK. This quiz is fill in the blanks. The test you will take will be multiple choice. On your official FCC test, the questions and answers will be IDENTICAL to the Q and As found our book. What follows here is a casual stroll through the Q&A in the Technician Class book, with my little Gordo humor to keep you on point.

ABOUT HAM RADIO *and* CALL SIGNS *(pages 33~44)*

1. Which agency regulates and enforces the amateur radio service in the USA? _____p. 33
2. What is the minimum age for a ham radio license? (Hint, no age limit)_____p. 33
3. Ham licenses are issued for how many years? _____p. 35
4. What is the grace period for an expired license? _____p. 35
5. How many license grants may a single operator hold for a personal license_____ p. 35
6. Give your call sign every how many minutes? _____p. 37
7. Could a technician class licensee have a vanity call K1XXX? _____p. 39
8. Club call signs may be granted to a club of _____ members. p.39
9. No call sign is given while controlling _____p. 38
10. If you're licensed in New York, what number will be in your first call sign? _____p. 41
11. Phonetic words for the letters H A M? _____p. 39
12. What spoken language is used to identify your call sign letter by letter? _____p. 40
13. Which ITU region are we in? _____p. 41
14. May we send third party traffic to Haiti? _____p. 43
15. When visiting Iceland, do we have a US reciprocal agreement? _____p. 44
16. Great web resource to look up ham radio call signs? _____p. 44

CONTROL *(pages 45~50)*

1. Every transmitting station needs to have a _____ operator? p. 45
2. Who may designate an alternate control operator? _____p. 46
3. May a technician class operator transmit on extra class frequencies?_____p. 47
4. Are school teachers, at work, allowed to demonstrate ham radio in the classroom? _____p. 49
5. A good web site to find some ham radio operating aids and references? _____p. 50

MIND THE RULES *(pages 51~54)*

1. Is willful interference allowed on the ham radio service?_____p. 51
2. What kind of transmission might be prohibited? _____p. 51
3. Give one example of a legal one-way transmission_____p. 52
4 May a ham operator use a voice scrambler for privacy?_____p. 53
5. May a ham buy or sell, occasionally, their radio gear over the air? _____p. 54
6. May a technician class operator play music for fun over the air? _____p. 53

8. What might result if the FCC can't reach you by mail? _____p. 54
9. Where might you purchase a printed copy of the Part 97 Rules? _____ p.50

TECH FREQUENCIES *(pages 55~64)*

1. What does the abbreviation "RF" stand for? _____p. 55
2. What are two components of a radio wave? _____p. 55
3. The velocity of radio waves through free space in meters is? _____p. 56
4. The abbreviation "MHz" stands for? _____p. 57
5. Frequency bands are usually identified by? _____p. 58
6. Frequency and wavelength are inversely proportional. What is that magic number? _____p. 59
7. 52 MHz is located in which meter band? _____p. 61
8. 146.52 MHz is located in which meter band? _____p. 61
9. What precaution when transmitting next to a band edge? _____p. 62
10. 223.5 MHz is located on which meter band? _____p. 62
11. 446 MHz Simplex is located on which meter band? (hint hint, the 446 MHz band) _____p. 63
12. Is a band plan "voluntary" or enforced by FCC rules? _____p. 62
13. Where might you score a free color band plan lookup? _____p. 63

YOUR FIRST RADIO *(pages 65~68)*

1. What does the "PTT" button do on your mic? _____p. 65
2. Have your radio pre-_____by your local ham dealer or club. p. 65
3. Store favorite frequencies in your radio's _____p. 65
4. Don't use a rubber duck antenna inside your _____p. 66
5. What type of modulation is commonly used for 2 meters and the 440 MHz band? _____p. 67
6. Packet radio uses this type of modulation, too. _____p. 67
7. Another name for a radio that is controlled by your favorite computer?_____p. 68

GOING SOLO – YOUR FIRST AMATEUR RADIO TRANSMISSION *(pages 69~78)*

1. Speak into your radio's _____p. 70
2. Listen to your radio's audio on this. _____p. 70
3. What circuit silences background noise? _____p. 69
4. Transmitting and receiving on the same frequency is called what? _____ p. 70

5. We use duplex when transmitting through a _____p. 71
6. When you test your radio on the air be sure to do this. _____p. 71
7. What does CQ mean? _____p. 72
8. Do this before transmitting on any frequency. _____p. 74
9. How do you call another station if you know their call sign? _____ p.73
10. Should you call "CQ" on your local hand held radio? _____ p. 72
11. What is the "Q" signal for interference? _____ p.77
12. Someone asks "QTH". What do they want? _____ p. 76
13. Your pal is going "QRT". What does this mean? _____p. 76
14. What is your grid location when operating near Miami, FL? _____ p. 78 & map at p.228
15. During a radio weekend contest, give only your information and _____ p.77

REPEATERS ***(pages 79~86)***

1. What device re-transmits amateur radio signals from your little handheld? _____p. 79
2. What is the term describing repeater transmit and repeater receive _____ p. 80
3. What is the usual offset for the 2 meter band? _____ p. 81
4. What is the usual repeater offset for the 70 cm band? _____ p.81
5. Most repeaters require CTCSS. What is this? _____p. 82
6. Who assigns specific frequencies to repeaters? _____p. 83
7. Do this before transmitting on any ham radio channel. _____ P. 84
8. Say THIS instead of CQ on a repeater, to announce that you are listening for a call. _____p. 84

EMERGENCY! ***(pages 87~92)***

1. Which radio call has the highest priority? _____ p.87
2. Whose rules prevail when handling emergency radio calls?_____ p. 88
3. What do the letters RACES stand for? _____p. 88
4. What do the letters ARES stand for? _____p. 89
5. What does "NCS" stand for in emergency comms?_____ p. 90
6. The good emergency communicator will always pass a message exactly as _____p. 91
7. What does the term "check" mean? _____p. 92
8. Use this alphabet when spelling unusual words? _____p. 91

WEAK SIGNAL PROPAGATION *(pages93~102)*

1. How much further do VHF/UHF radio signals travel line of sight? _____p. 93
2. Are VHF and UHF signals regularly affected by the ionosphere? _____p. 94
3. Use "knife edge" propagation to transmit over? _____p. 95
4. A warm air inversion creates what type of propagation? _____p. 95
5. How many layers are there of the ionosphere during the day? _____p. 97
6. Catch a falling star and try this? _____p. 96
7. Ultraviolet radiation from this heavenly body ionizes the ionospheric layers? _____p. 98
8. Best time for 10 meter Technician Class skywaves? _____ p.99
9. Which property of a radio wave describes its polarization? _____p. 101

TALK TO OUTER SPACE *(pages 103~108)*

1. Are Technician Class operators permitted to transmit to the International Space Station? _____p. 103
2. Hear the International Space Station on this FM frequency during a pass._____ p. 104
3. What does LEO refer to? _____p. 104
4. Signals containing information from a satellite onboard computer? _____p. 105
5. What causes satellite signals to fade in and out? _____p. 106
6. Compensate for this when the satellite is approaching from the horizon. _____p. 106
7. In the U/V mode, on what band do you transmit? _____ p.108
8. How much power should you use when transmitting to a satellite? _____p. 107
9. Which ham group promotes space communications? _____ p. 108
10. Great WWW to learn how to work satellites _____ p.108
11. Simple satellite portable antenna for hand held operation _____ p.108
12. Find the next satellite pass with this WWW _____ p.108

YOUR COMPUTER GOES HAM DIGITAL *(pages 109~118)*

1. Is Morse code a digital mode? (hint hint YES, and it's fun to try!) _____p. 109
2. The bottom of 6 meters and 2 meter bands is limited to this: _____ p. 109
3. Could your home computer or laptop be rigged up to send and receive CW? _____p. 110
4. What device connects between your transceiver and your computer for digital? _____p. 111
5. What portion of your computer decodes digital signals? _____p. 111
6. What are packet, IEEE 802.11, JT65 plus the new FT8 modes?_____p. 112

7. What is the exciting mode APRS where we see you on our computer screen?_____ p. 114
8. An APRS station gets its position from what? _____p. 114
9. What connects a ham radio station into the internet? _____p. 115
10. What do the letters IRLP stand for? _____p. 115
11. What do the letters VOIP stand for? _____p. 116
12. What is the bandwidth of analog fast-scan ham transmissions on 70 cm? _____p. 118
13. What is the WWW for the fun ATV fast scan analog/digital modes _____p. 118

MULTI-MODE RADIO EXCITEMENT *(pages 119~130)*

1. The fancy name for your transmitter and receiver packaged in one handheld device? _____p. 119
2. What type of transceiver is needed to operate satellite SSB? _____p. 120
3. Do we use upper or lower sideband on 10 meters? _____p. 121
4. You mean new technician class operators can work the long range bands too? _____ p.120
5. What is the name used to describe speech within an RF carrier? _____p. 121
6. What is the bandwidth of an SSB voice signal? _____p. 122
7. What do the letters "RIT" stand for? _____p. 123
8. What is the skinny bandwidth of a Morse Code CW signal? _____p. 124
9. What radio transmission mode has the narrowest bandwidth? _____p. 124
10. Give the term describing the ability to receive a weak signal? _____p. 125
11. What is the term describing a radio's ability to separate multiple signals? _____p. 126
12. What does the term AGC stand for in a SSB receiver? _____p. 126
13. What device would convert a 2 meter radio up to 10,000 MHz band? _____p. 126
14. What is a DMR hand held radio? _____ p.128
15. How do you join a DMR digital mobile radio TALK GROUP? _____ p.128
16. What the heck is a DIGIPEATER?_____p. 129
17. Don't throw out your old computer router! Use it on_____ p.129

RUN SOME INTERFERENCE PROTECTION *(pages 131~138)*

1. If your hand held radio battery is low, your voice may _____p. 131
2. On a worldwide radio, don't set the mic gain too _____ p. 131
3. On a 10 meter worldwide radio, use this to block ignition interference. _____p. 132
4. What is the likely source of a whistle on your mobile radio transmission? _____p. 133

5. Distorted 10 meter transmit audio may be cured by using one of these. _____p. 133
6. Fundamental overload to a TV might be resolved with tightening _____p. 133
7. What type of wires should be used to minimize unwanted signal coupling? _____p. 134
8. Put these on your corded telephone to minimize transmit interference? _____ p. 135
9. Part 15 devices use high power or low power radio signals? _____p. 136
10. Your new worldwide 10 meter transceiver comes over your neighbor's computer speakers when you transmit. What may help resolve this common interference? _____p. 137

ELECTRONS – GO WITH THE FLOW *(pages 139~151*)

1. What does "EMF" mean? _____p. 139
2. What is the basic unit of electromotive force? _____p. 139
3. Name one type of rechargeable battery for your new handheld. _____p. 140
4. Which battery type, found in your big flashlight, is NOT rechargeable? _____p. 140
5. What do we call the flow of electrons? _____p. 141
6. Amperes is the unit used to measure what? _____p. 141
7. What material is a good electrical conductor? _____p. 142
8. This device allows current to flow in one direction only. _____p. 143
9. What component opposes the flow of current in a DC circuit? _____p. 144
10. A potentiometer is actually a variable? _____p. 144
11. What material is a good electrical insulator? _____p. 145
12. Another name for a coil of wire? _____p. 145
13. The word used to describe energy stored in a magnetic field? _____p. 145
14. The word used to describe energy stored in an electrical field? _____p. 146
15. A component used to turn on and off a circuit? _____p. 147
16. A component that protects from current overload? _____p. 148
17. This device may amplify a signal? _____p. 148
18. What does the abbreviation "FET" stand for? _____p. 150

IT'S THE LAW, PER MR. OHM! *(pages 152~158)*

1. Draw 2 different types of Ohm's Law circles: _____p. 152
2. Power equals _____ x _____p. 153
3. Voltage equals _____ X _____ p. 154

4. What is voltage across each of two parallel components?_____ p. 155
5. What is voltage across each of two SERIES components? _____ p. 155
6. What circuit has the same CURRENT through all components?_____ p. 157
7. What happens to current at the junction of two components in parallel? _____ p.158
8. If you are calculating current, it is voltage divided by? _____ p. 157
9. If you are calculating resistance, it is voltage divided by? _____ p. 158
10. What is the voltage across a 2 Ohm resister with 0.5 amps flowing through it? _____p. 154
11. What is the current flowing through a 24 Ohm resister connected across 240 volts? _____p. 157
12. What is the resistance that draws 4 amperes from a 12 volt battery? _____p. 158
13. In most of the exam calculations, you usually are dividing the larger number by the? _____p. 158

PICTURE THIS! ***(pages 159~170)***

1. What is the name for components depicted on an electrical wiring diagram? _____p. 159
2. Draw the symbol for a variable inductor. _____p. 160
3. Draw the symbol for an antenna. _____p. 160
4. Draw the symbol for a fixed resistor. _____p. 161
5. Draw the symbol for a transistor. _____p. 161
6. Draw the symbol for a pilot lamp. _____p. 161
7. See page 162, Figure 2, and learn each of the component diagrams! _____p. 162
8. A transmit power increase from 10 watts to 20 watts is how many dB increase? _____p. 165
9. What does LED stand for? _____p. 166
10. How many volts is 1 kilovolt? _____p. 167
11. Convert 28,400 kilohertz to megahertz. _____p. 167
12. How many watts is 500 milliwatts? _____p. 168
13. A cold solder joint looks like this: _____p. 169
14. Connecting your Ohm meter on ohms scale to 12 volts DC will result in: _____p. 170

ANTENNAS ***(pages171~178)***

1. What is the name of a simple wire antenna that is one-half wavelength long that is fed by coax in the middle? _____p. 171
2. In which direction is the signal strongest from a half wave antenna? _____p. 172
3. Do this to the half wave antenna to raise its resonant frequency. _____p. 172

4. What is another name for a quarter wavelength vertical antenna? _____p. 173
5. A dish antenna is always very _____p. 173
6. What is another name for a beam antenna? _____ P. 174
7. A name for finding unknown signals with a portable beam? _____p. 175
8. On a VHF or UHF contact, make sure both antennas are of the same _____p. 176

FEED ME WITH SOME GOOD COAX! ***(pages 179~187)***

1. Is coax cable round or flat? _____p. 179
2. Why is coax cable easy to use? _____p. 179
3. What is the common impedance of coax for ham radio use? _____p. 180
4. What type of coaxial cable connector are you likely to find on your new 10 meter high-frequency radio? _____ On your dual band hand held? _____ p.180
5. Frequencies above 400 MHz need this type of waterproof cable connector. _____p. 181
6. What is a common cause of coax cable failure? _____p. 181
7. The physically larger size coax usually offers _____ line losses? p. 182
8. What is a perfect SWR match between the antenna and the feed line? _____p. 184
9. What's the likely cause of an SWR reading of 4:1? _____p. 184
10. What device allows you to test a transmit signal without interfering with others? _____p. 187

SAFETY FIRST! ***(pages189~201 the end of the Qs!!!!)***

1. Good ways to guard against getting shocked? _____p. 189
2. What does the green wire in an AC power cord provide? _____p. 189
3. The fuse interrupts power in case of what? _____p. 190
4. What might happen if you replace a blown 5 amp fuse with a 50 amp fuse? _____p. 190
5. What health hazard is current passing through your body?_____p. 191
6. If you overcharge a lead acid battery, it could _____p. 192
7. Watch out for these when putting up an antenna or tower! _____p. 193
8. Should you ever climb a tower without a helper and proper safety equipment? _____p. 193
9. Good equipment to wear when climbing up the tower? _____p. 194
10. Add this to a tower guy turnbuckle for safety_____p.194
11. On a crank-up 3-section tower, never climb it unless it is first cranked all the way _____p. 195
12. What is the best type of conductor for RF grounding? _____p. 196

13. When assessing RF exposure, dramatically raising power output is safe or unsafe? _____p. 197
14. What frequency band has the lowest value for maximum permissible exposure? _____ p.198
15. Keep everyone safe around your radio system by operating at what power output levels? ___ p. 198
16. What might happen if a person accidentally touches your mobile bare whip antenna when you or someone else is transmitting? _____p. 201

TAKING THE EXAM & RECEIVING YOUR FIRST RADIO LICENSE *(pages202~212)*

WHEW! You made it through the entire Q&A topics and some fun questions that could be on the exam! Great work! Now, here is what the exam room is all about!

1. What number do you call to locate an exam site? _____p. 202
2. Typically, how much does it cost to take the exam? _____p. 203
3. Are calculators permitted during the exam? _____p. 203
4. Can your exam use different words or numbers? _____ P. 203
5. If this is your first license, your social security number will be converted to what? _____p. 204
6. The FCC will not normally mail out a paper copy of your new license. You must download it from _____, the FCC's ULS database. p. 207
7. What system may allow you to trade your call sign for one with your initials? _____ p.210
9. Where in the book will you find the W5YI RF Safety Tables, common CW abbreviations, and the Element 2 Q&A Cross Reference list? The _____p. 221

That's it from me, Gordo ! Pass that test, write me for your free graduation package, meet with me at large ham fests, and GET ON THE AIR. Don't even think about that next upgrade license until you GET ON THE AIR!

Questions? Call me Monday through Thursdays, 10AM California time to 4 PM California time, at 714 549-5000.

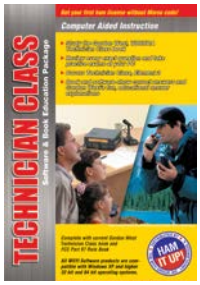
I will hear you on the airwaves real soon!

Gordon West
WB6NOA
wb6noa@arrl.net

Additional Learning Resources…

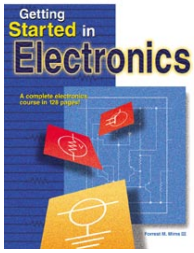
…for your exam preparation, or to continue your education after you receive your FCC Technician Class License.

Technician Class Audio Course on 4 audio CDs
Welcome to Gordo's classroom! These 4 standard audio CDs, recorded by Gordon West, WB6NOA, with Eric Nichols, KL7AJ, talk you through the Element 2 Question Pool. The tracks on the CD match-up with the Technician Class book, and the material is enhanced with the sounds of ham radio excitement! Includes free Part 97 Rule Book. GWTW-18 $29.95



Technician Class HamStudy Software
You already have the ***Technician Class*** study manual. Consider adding our interactive software to help you get ready for your big exam! When you answer a question wrong on the practice exam, the explanation from Gordo's book appears on the screen to reinforce your learning. For Windows operating systems. Includes free Part 97 Rule Book. Special offer NCS CD ONLY $15.00

Basic Communications Electronics
By Jack Hudson, W9MU, and Jerry Luecke, KB5TZY.
Explains analog electronic devices and circuits – how they work and how they are used to build communication systems. For anyone who wants to understand analog electronics and wireless communications. When you're done studying this book, you'll really know what's going on inside your new ham radio!
BCOM $19.95



Getting Started in Electronics
By Forrest M. Mims III. This is a complete electronics course in 128 pages! This famous electronics inventor teaches you the basics, takes you on a tour of analog and digital components, explains how they work, and shows how they are combined for various applications. Includes circuit assembly tips and 100 electronic circuits you can build and test. GSTD $19.95

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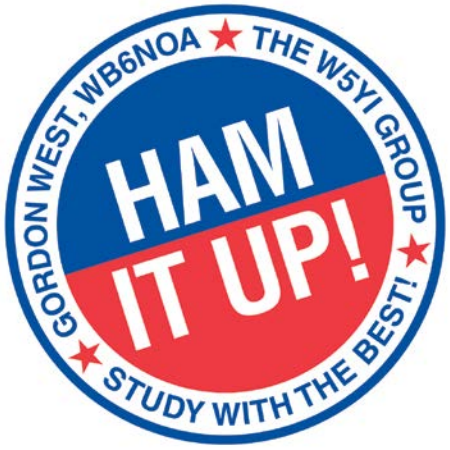

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