

Technician Class

Pre-Study Question Packet

(2022 – 2026)

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 yourself for the FCC Technician class written exam. When you pass, you'll receive your first amateur radio license and FCC call sign. By studying my *Technician Class* book and completing this *Pre-Study Question Packet*, you'll also be ready to get on the air!

Did you know that you can find bonus supplemental audio content that I refer to as my *On the Air Audio Experiences* which are housed exclusively in ARRL's Learning Center? Check them out as you are studying! I also have teaching PowerPoints called "Gordon West Instructor Technician Class License Presentations" here. These are only accessible to ARRL Registered Instructors.

I encourage you to get a head start on class with this *Pre-Study Packet*. Go through selected sections with the book before each classroom session. These sections closely follow the book, and I even include page numbers to guide you to the correct answers!

The questions in this *Pre-Study Packet* are in a casual fill-in-the-blanks format. Your actual Technician Class FCC Element 2 exam will be multiple choice exactly like the book, which makes it all that much easier! You will likely spot the test's correct answer in a nanosecond!

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 and let's talk ham radio! (see my contact information below)

A foreword written by Gordon West.

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*A reminder that any available Gordon West material can only be accessed via the digital ARRL Learning Center site <https://learn.arrl.org/> or for purchase on the ARRL main website at <https://www.arrl.org/gordon-west>

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GETTING INTO HAM RADIO (pages 1~4)

These won't be test questions, but file these "factos" in your grey matter to become a great ham radio operator. No, I have no clue where the word "ham" came from. 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)

Nope, you don't need to memorize all this fun stuff here, but give it a read to better understand where our radio bands are located on the big radio dial!

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. 16
12. What is another name for CW? _____ p. 16
13. In addition to Morse code, 10 meter privileges include long range _____ p. 16
14. What is the frequency range of voice privileges on 10 meters? _____ p. 16
15. The free audio course that comes with the book, play it _____ details inside front cover
16. Above what frequency are ham bands shared with other services? _____ p. 17
17. Ask your exam team how to join a local _____ p. 18

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

Here is where it all began! From wires to wireless, ham radio takes to the airwaves last century! Nothing to memorize here, but fun reading on our 100 + year history! Good stuff to know on the latest rules and regs for our service! Fill in the blanks here!

1. Ham radio promotes international _____ p. 19
2. When did ham radio licensing begin? _____ p. 20
3. What test requirement has been eliminated for a ham radio license? _____ p. 20
4. What are the 3 grades of current ham radio licenses? _____ p. 20
5. When did volunteer examiners take over administering ham exams? _____ p. 21
6. Can you jump over Technician to go direct to General without the tech test? _____ p. 21
7. How many examiners are required to give ham radio exams? _____ p. 23
8. Which Exam Element for the Technician Class exam? _____ p. 23
9. New FCC application fee? \$ _____ p. 24
10. Which application form will you complete at the exam site? _____ p. 24

11. Long expired licenses may be earned back by passing the technician exam? _____ p. 25
12. Call this number for old-license information for grandfather information: 1-800 _____ p. 26

GETTING READY FOR THE EXAM (pages 27~32)

OK, here is the good stuff. None of this on the actual test, but here is what you do need to know to get prepared for the Technician Class element 2 exam!

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. Watch videos on YouTube - details here! _____ p. 31
11. Our rearrangement of Q&As begins with which topic? _____ p. 32
12. We finish by covering which important aspect of ham radio? _____ 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&As found my book. What follows here is a casual stroll through my *Technician Class* book, with my little Gordo humor to keep you on point.

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

Here we go with a Gordo-review of test topics, which I paraphrase here. The exact FCC test questions are in my yellow *Technician Class* book. Use the book to easily answer what I ask here and fill in the blanks with a portion of the correct answer! I have reorganized all the materials for classes that I teach, so use only my *Technician Class* book for finding the correct answer with the page numbers here!

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. No call sign is given while controlling _____ p. 38
8. Could a technician class licensee have a vanity call K1XXX? _____ p. 39
9. Club call signs may be granted to a club of _____ members _____ p. 39
10. Phonetic words for the letters H A M? _____ p. 39
11. What spoken language is used to identify your call sign letter by letter? _____ p. 40
12. If you're licensed in New York, what number will be in your first call sign? _____ p. 41
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. 43
16. Great web resource to look up ham radio call signs? _____ p. 44

CONTROL (pages 45~50)

Most hams know the rules and regulations, so jump right in!

1. Every transmitting station needs to have an _____ 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

Other great web sites are <https://www.arrl.org>, <https://www.eham.net> for practice tests, <http://aa9pw.com> for Morse code and more practice exams.

MIND THE RULES (pages 51~54)

1. Where might you purchase a printed copy of the ham radio Part 97 Rules? (hint: W5YI.org) _____ p. 50
2. Is willful interference allowed on the ham radio service? _____ p. 51
3. What kind of transmission might be prohibited? _____ p. 51
4. Give one example of a legal one-way transmission _____ p. 52
5. May a ham operator use a voice scrambler for privacy? _____ p. 52
6. May a ham buy or sell, occasionally, their radio gear over the air? _____ p. 53
7. 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

TECH FREQUENCIES (pages 55~64)

Do not panic ... you do not need to memorize each and every technician class band! That is why I made up band charts that you see in the book. The book has the exact FCC test questions - no more, no less! These fill in the blanks are to get you warmed up.

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. 62
9. 223.5 MHz is located on which meter band? _____ p. 62
10. What precaution when transmitting next to a band edge? _____ p. 63
11. Is a band plan “voluntary” or enforced by FCC rules? _____ p. 63
12. 446 MHz Simplex is located on which meter band? (hint hint: the 446 MHz band) _____ p. 64
13. Where might you score a free color band plan lookup? _____ p. 64

OK, back to abbreviations...Megahertz is MHz, upper case M and H. Kilohertz is abbreviated lower case k, upper case H, and lower case z = kHz. A ham radio writer is considered a LID (poor operator) for not getting MHz and kHz properly abbreviated!

YOUR FIRST RADIO (pages 65~68)

You can let a local dealer or local hams help you program a hand held for local channels, to get you started on the air! Join a ham radio club and let them help you clone your radio to favorite local ham repeaters and the International Space Station, (145.800 MHz) plus the Space Station cross band repeater output on 437.800MHz!

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? (HINT: software defined) 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. 70
4. Transmitting and receiving on the same frequency is called what? _____ p. 71
5. We use duplex when transmitting through a (hint: repeater) _____ p. 71
6. When you test your radio on the air be sure to do this: _____ p. 72
7. Should you call "CQ" on your local hand held radio? _____ p. 72
8. What does CQ mean? _____ p. 73
9. Do this before transmitting on any frequency _____ p. 73
10. How do you call another station if you know their call sign? _____ p. 73
11. What is the "Q" signal for interference? _____ p. 75
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 & p. 206
15. During a radio weekend contest, give only your information and _____ p. 77

REPEATERS (pages 79~84)

Repeaters are on building tops and mountain tops for extending your hand held range. Some are even connected to the internet for extending your hand held range around the world to other repeaters. (IRLP) (page 83) Listen for at least a day or two before transmitting on a new repeater to get the hang of things.

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. 80
4. What is the usual repeater offset for the 70 cm band? _____ p. 81
5. Most repeaters require CTCSS. What is this? _____ p. 81
6. Who assigns specific frequencies to repeaters? _____ p. 82
7. Do this before transmitting on any ham radio channel. _____ p. 83
8. Say THIS instead of CQ on a repeater, to announce that you are listening for a call. _____ p. 83

Repeaters are party lines - everyone is listening, so always pause a few seconds before you pick up the conversation, to let others come in and join your chat. Do not “quick key” a repeater. Again, listen for a day or two to get the hang of how to operate on an open repeater.

EMERGENCY! (pages 85~90)

1. Which radio call has the highest priority? _____ p. 85
2. Whose rules prevail when handling emergency radio calls? _____ p. 86
3. What do the letters RACES stand for? _____ p. 86
4. What do the letters ARES stand for? _____ p. 87
5. What does “NCS” stand for in emergency comms? _____ p. 87
6. The good emergency communicator will always pass a message exactly as _____ p. 89
7. What does the term “check” mean? _____ p. 89
8. Use this alphabet when spelling unusual words? _____ p. 90

WEAK SIGNAL PROPAGATION (pages 91 ~ 100)

Here we learn how far your radio signals may travel to another station or a distant repeater. On your dual band radio, weather conditions may give your signal an every-July boost! On 10 meters High Frequency, summertime and December sporadic E conditions may refract your 10 meter and 6 meter signals off the ionosphere, and come back down in another state, or another country, during daylight hours. Wow, ham radio will be fun!

1. How much further do VHF/UHF radio signals travel line of sight? _____ p. 91
2. Are VHF and UHF signals regularly affected by the ionosphere? _____ p. 92
3. Use “knife edge” propagation to transmit over? _____ p. 93
4. A warm air inversion creates what type of propagation? _____ p. 93
5. Catch a falling star and try this? _____ p. 94
6. How many layers are there of the ionosphere during the day? _____ p. 95
7. Ultraviolet radiation from this heavenly body ionizes the ionospheric layers? _____ p. 96
8. Best time for 10 meter Technician Class skywaves? _____ p. 97
9. Which property of a radio wave describes its polarization? _____ p. 98

TALK TO OUTER SPACE (pages 101 ~ 106)

1. Hear the International Space Station on this frequency during a pass_ FM _____ p. 101
2. Are Technician Class operators permitted to transmit to the International Space Station? _____ p. 102
3. What does LEO refer to? _____ p. 102
4. Signals containing information from a satellite onboard computer? _____ p. 103
5. What causes satellite signals to fade in and out? _____ p. 104
6. Compensate for this when the satellite is approaching from the horizon. _____ p. 104
7. How much power should you use when transmitting to a satellite? _____ p. 105
8. In the U/V mode, on what band do you transmit? _____ p. 106
9. Which ham group promotes space communications? _____ p. 106
10. Great WWW to learn how to work satellites _____ p. 106
11. Simple satellite portable antenna for hand held operation _____ p. 106
12. Find the next satellite pass with this WWW _____ p. 106

YOUR COMPUTER GOES HAM DIGITAL (pages 107~ 116)

1. Is Morse code a digital mode? (hint hint: YES, and it's fun to try!) _____ p. 107
2. The bottom of 6 meter and 2 meter bands is limited to this: _____ p. 107
3. Could your home computer or laptop be rigged up to send and receive CW? _____ p. 108
4. What portion of your computer decodes digital signals? _____ p. 109
5. What are packet, IEEE 802.11, JT65 plus the new FT8 modes? _____ p. 109
6. What device connects between your transceiver and your computer for digital? _____ p. 110
7. What is the exciting mode APRS where we see you on our computer screen? _____ p. 112
8. An APRS station gets its position from what? _____ p. 112
9. What connects a ham radio station into the internet? _____ p. 113
10. What do the letters IRLP stand for? _____ p. 113
11. What do the letters VOIP stand for? _____ p. 114
12. What is the bandwidth of analog fast-scan ham transmissions on 70 cm? _____ p. 115
13. What is the WWW for the fun ATV fast scan analog/digital modes _____ p. 116

MULTI-MODE RADIO EXCITEMENT (pages 117~128)

Once you have been on the air with your hand held and mobile FM transceiver, you may want to get a multi-mode base station which will allow for working 10 meters and all the High Frequency Bands. Some multi-mode transceivers let you work 2 meters on single sideband, as well as 432 MHz SSB, to work some of those multi-mode satellites!

1. The fancy name for your transmitter and receiver packaged in one handheld device? _____ p. 117
2. What type of transceiver is needed to operate satellite SSB? _____ p. 117
3. Do we use upper or lower sideband on 10 meters? _____ p. 119
4. You mean new technician class operators can work the long range bands too? _____ p. 117
5. What is the name used to describe speech within an RF carrier? _____ p. 118
6. What does the term clarifier stand for in a SSB receiver? _____ p. 121
7. What is the bandwidth of an SSB voice signal? _____ p. 120
8. What do the letters "RIT" stand for? _____ p. 121
9. What is the skinny bandwidth of a Morse Code CW signal? _____ p. 122
10. What radio transmission mode has the narrowest bandwidth? _____ p. 122
11. Give the term describing the ability to receive a weak signal? _____ p. 122
12. What is the term describing a radio's ability to separate multiple signals? _____ p. 123
13. What device would convert a 2 meter radio up to 10,000 MHz band? _____ p. 124
14. What is a DMR hand held radio? _____ p.125
15. How do you join a DMR digital mobile radio TALK GROUP? _____ p.125
16. What the heck is a DIGIPEATER? _____ p. 126
17. Don't throw out your old computer router! Use it on _____ p.127

If you are into computers, ham radio will add some real excitement, using your computer as a software defined radio (SDR), where the computer will fill the screen with radio signals! The new mode "FT8" could let you work other stations all over the world in 15 second data bursts that you can't even hear over the speaker! And computers set up with repeaters on mountaintops and building tops will let your little hand held radio be heard all over the world on other repeaters, called IRLP. Then there is D-Star, Echolink, DMR, and Broadband-Hamnet - all of these new modes are wide open for you to operate as a technician class operator.

RUN SOME INTERFERENCE PROTECTION (pages 129~134)

1. If your hand held radio battery is low, your voice may _____ p. 129
2. On a worldwide radio, don't set the mic gain too _____ p. 129
3. What is the likely source of a whistle on your mobile radio transmission? _____ p. 130
4. On a 10 meter worldwide radio, use this to block ignition interference. _____ p. 131
5. What type of wires should be used to minimize unwanted signal coupling? _____ p. 131
6. Part 15 devices use high power or low power radio signals? _____ p. 131
7. Your new worldwide 10 meter transceiver comes over your neighbor's computer speakers when you transmit. What may help resolve this common interference? _____ p. 131
8. Put these on your corded telephone to minimize transmit interference? _____ p. 132
9. Distorted 10 meter transmit audio may be cured by using one of these. _____ p. 132
10. Fundamental overload to a TV might be resolved with tightening _____ p. 133

Gordo here again - your little 2 meter/440 MHz hand held will seldom interfere with home electronics! The high frequency worldwide 10 meter radio, where you can bounce signals off the ionosphere, may come over nearby computer speakers, and this problem is easily resolved with new shielded speaker wires and common chokes that snap over these wires, seen on page 133. All ham radio stores carry these chokes that simply snap over wires! Easy fix! If you are into electronics big time, look at page 134 at all the information available to learn more!

ELECTRONS – GO WITH THE FLOW (pages 135~ 147)

1. What does “EMF” mean? _____ p. 135
2. What is the basic unit of electromotive force? _____ p. 135
3. Name one type of rechargeable battery for your new handheld. _____ p. 136
4. Which battery type, found in your big flashlight, is NOT rechargeable? _____ p. 136
5. What do we call the flow of electrons? _____ p. 137
6. Amperes is the unit used to measure what? _____ p. 137
7. What material is a good electrical conductor? _____ p. 138
8. This device allows current to flow in one direction only. _____ p. 139
9. What component opposes the flow of current in a DC circuit? _____ p. 140
10. A potentiometer is actually a variable? _____ p. 141
11. What material is a good electrical insulator? _____ p. 141
12. Another name for a coil of wire? _____ p. 141
13. The word used to describe energy stored in a magnetic field? _____ p. 142
14. The word used to describe energy stored in an electrical field? _____ p. 143
15. A component that protects from current overload? _____ p. 143
16. A component used to turn on and off a circuit? _____ p. 145
17. This device may amplify a signal? _____ p. 145
18. What does the abbreviation “FET” stand for? _____ p. 145

IT'S THE LAW, PER MR. OHM! (pages 148~154)

Oh, you are a little rusty on math? Do not panic - I will make it fun and easy to remember in the book, and right here ... by either multiplying or dividing the smaller number into the larger number for the correct answer. No answers will come out in a fraction - easy stuff!

Remember, Voltage (E) is like water pressure at the spigot in your garden. Now turn on the valve, and Current (I) is like the flow in that garden hose. Resistance (R) is like a kink in the hose, restricting the flow of water. The Power (P) to make your lawn look green is from the water pressure (E) x the current (I) coming out of the hose!

1. Draw 2 different types of Ohm's Law circles: _____ p. 148
2. Power equals _____ x _____ p. 148
3. Voltage equals _____ x _____ p. 150
4. What is the voltage across a 2 Ohm resistor with 0.5 amps flowing through it? _____ p. 150
5. What is voltage across each of two parallel components? _____ p. 151
6. If you are calculating current, it is voltage divided by? _____ p. 151
7. What is the current flowing through a 24 Ohm resistor connected across 240 volts? _____ p. 152
8. What is the resistance that draws 4 amperes from a 12 volt battery? _____ p. 152
9. In most of the exam calculations, you usually are dividing the larger number by the? _____ p. 152
10. What is voltage across each of two SERIES components? _____ p. 153
11. What circuit has the same CURRENT through all components? _____ p. 153
12. What happens to current at the junction of two components in series? _____ p.153
13. If you are calculating resistance, it is voltage divided by? _____ p. 153

PICTURE THIS! (pages 155~166)

All hams know what simple component diagrams look like. Nothing hard here, but scope out the book to see for yourself what all the squiggly lines mean!

1. What is the name for components depicted on an electrical wiring diagram? _____ p. 155
2. Draw the symbol for a variable inductor. _____ p. 155
3. Draw the symbol for an antenna. _____ p. 156
4. Draw the symbol for a fixed resistor. _____ p. 156
5. Draw the symbol for a transistor. _____ p. 156
6. Draw the symbol for a pilot lamp. _____ p. 156

7. See page 158, Figure 2, and learn each of the component diagrams! _____ p. 158
8. A transmit power increase from 10 watts to 20 watts is how many dB increase? _____ p. 160
9. What does LED stand for? _____ p. 162
10. How many volts is 1 kilovolt? _____ p. 163
11. Convert 28,400 kilohertz to megahertz. _____ p. 163
12. How many watts is 500 milliwatts? _____ p. 163
13. A cold solder joint looks like this: _____ p. 165
14. Connecting your Ohm meter on ohms scale to 12 volts DC will result in: _____ p. 166

Now that wasn't that hard, was it? That figure 2 on page 158 is a common test question, so learn to ID each of the squiggles!

ANTENNAS (pages 167~174)

Great signals come from any kind of radio with great antennas!

1. What is the name of a simple wire antenna that is one-half wavelength long fed by coax in the middle?
_____ p. 167
2. In which direction is the signal strongest from a half wave antenna? _____ p. 168
3. Do this to the half wave antenna to raise its resonant frequency. _____ p. 168
4. What is another name for a quarter wavelength vertical antenna? _____ p. 169
5. What is another name for a beam antenna? _____ p. 169
6. A name for finding unknown signals with a portable beam? _____ p. 170
7. A Yagi antenna is always very _____ p. 172
8. On a VHF or UHF contact, make sure both antennas are of the same _____ p. 172
9. Best place to mount a VHF or UHF mobile antenna for best performance ... this was an older test question which illustrated a mobile antenna in the center of the car roof, with a hole in the center of the roof for the antenna mounting. Not necessary – a magnetic mount will do fine on the trunk lid, or get a trunk lip mount that won't leave any holes, and is very sturdy and won't blow off! But most important, get your hand held radio hooked up to an outside mobile antenna.

FEED ME WITH SOME GOOD COAX! (pages 175~184)

Think of coax like that garden hose. Coax must handle pressure and volume, and take your transmit radio energy and squirts it to the antenna without leaks. It takes antenna receive signals and dribbles it down to your radio, with no leaks to let in noise on receive.

1. Is coax cable round or flat? _____ p. 175
2. Why is coax cable easy to use? _____ p. 175
3. What is the common impedance of coax for ham radio use? _____ p. 176
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. 177
5. Frequencies above 400 MHz need this type of waterproof cable connector. _____ p. 177
6. What is a common cause of coax cable failure? _____ p. 177
7. The physically larger size coax usually offers _____ line losses? _____ p. 178
8. What is a perfect SWR match between the antenna and the feed line? _____ p. 179
9. What's the likely cause of an SWR reading of 4:1? _____ p. 181
10. What device allows you to test a transmit signal without interfering with others? _____ p. 183

Think of "SWR" as garden hose water that leaks out under your thumb, because your neighbor drove over the end of it in the driveway. You no longer have a good thumb connection to squirt out the end of the crunched hose end!

SAFETY FIRST! (pages 185~196) **WATCH OUT!** Voltage is dangerous!

1. Good ways to guard against getting shocked? _____ p. 185
2. What does the green wire in an AC power cord provide? _____ p. 185
3. The fuse interrupts power in case of what? _____ p. 186
4. What might happen if you replace a blown 5 amp fuse with a 50 amp fuse? _____ p. 186
5. What health hazard is current passing through your body? _____ p. 187
6. If you overcharge a lead acid battery, it could _____ p. 188
7. Watch out for these when putting up an antenna or tower! _____ p. 188
8. Should you ever climb a tower without a helper and proper safety equipment? _____ p. 190
9. Good equipment to wear when climbing up the tower? _____ p. 190
10. Add this to a tower guy turnbuckle for safety _____ p. 190
11. On a crank-up 3-section tower, never climb it unless it is first cranked all the way _____ p. 190
12. What is the best type of conductor for RF grounding? _____ p. 191
13. When assessing RF exposure, dramatically raising power output is safe or unsafe? _____ p. 192
14. Keep everyone safe around your radio system by operating at what power output levels? (hint: **MINIMUM LOW NOT HIGH POWER**) _____ p. 196
15. What might happen if someone accidentally touches your mobile bare whip antenna when someone else is transmitting? _____ p. 196

EXTRA CREDIT!!

The following questions are my casual worded "new" topics on the test! To prepare for the "new" test, add these to your current home study homework!

1. FCC corresponds to you only using _____ p. 54
2. If the FCC can't contact you, you could lose _____ p. 54
3. Radio wave electric and magnetic fields are at _____ s to each other. _____ p. 55
4. Abbreviation of kilohertz _____ and megahertz _____. _____ p. 57
5. P T T? _____ to _____. _____ p. 65
6. I can't hear you ... turn off your _____ for continuous audio output. _____ p. 70
7. FM signals will be distorted if tuned in too _____ or _____. _____ p. 73

8. Cancels or adds to 2m reception M _____ P _____ propagation. _____ p. 75
9. Two words to describe RACES C _____ D _____ p. 86
10. Vegetation and trees on UHF do this: _____ p. 92
11. 10m Tech phone frequencies _____._____ to _____._____ MHz _____ p. 99
12. L E O, a satellite in a _____ . _____ p. 102
13. Morse code is also called _____ . _____ p. 107
14. Data line computer IN from radio's _____ connector. _____ p. 109
15. A digital hot spot could get you on to the _____ p. 109
16. Popular FT8 software _____ - X. _____ p. 110
17. Weather, position, and text messages via _____ . _____ p. 112
18. PAIRS of audio tones _____ p. 113
19. Talk groups in a DMR radio use a _____ . _____ p. 126
20. D-Star radios must have your _____ entered. _____ p. 127
21. No radio, and on your computer, but a license needed for _____ repeater transmitting. _____ p. 127
22. Radio run time on a battery, = _____ rating divided by radio's average current draw. p. 136
23. 50 watts output on 2m draws about _____ amps on high power. _____ p. 139
24. Diode voltage drops, same in all diodes? _____ p. 139
25. DC, AC, and RF are opposed by electrical _____ . _____ p. 140
26. Bipolar junction transistor has E _____ B _____ C _____ . _____ p. 145
27. Transistor with gate, drain, & source _____ d - _____ t _____ p. 146
28. What is a S P D T and how many circuits will it provide?
_____, _____ circuits _____ p. 157
29. An LED lights with _____ DC current in a circuit. _____ p. 162

30. An ohm meter across a good discharged electrolytic capacitor will first jump to minimal resistance, and then _____ing resistance in time. _____ p. 166
31. What antenna offers maximum gain in one direction? _____ p. 169
32. SWR meters for 2m are selected by _____ and power. Your CB SWR meter won't make it up to 146 MHz. _____ p. 174
33. An AC circuit breaker goes in series with the _____ conductor only. _____ p. 186
34. A lightening arrester needs a big _____ . _____ p. 192
35. Who is responsible for station RF exposure limits _____ . _____ p. 196

TAKING THE EXAM & RECEIVING YOUR FIRST RADIO LICENSE (pages 197~208)

Whew! You made it through the entire list of topics and some fun questions that could be on the test! Great work! Now, here is what the exam room is all about!

1. N/A
2. Typically, how much cash does it cost to take the exam? (Remember the FCC fee of \$35 later)
_____ p. 199
3. Are calculators permitted during the exam? _____ p. 200
4. Can your exam use different words or numbers? NEVER! What you see in the yellow book is exactly what might be chosen for your test! _____ p. 197
5. If this is your first license, you need to obtain a "FRN" _____ p. 198
6. Your email must be legible for the FCC to email your license!! YES YES YES! The FCC will not normally mail out a paper copy - you must easily download it from the FCC site. Follow their email instructions to score your new call sign! _____ p. 200 & p. 204
7. What system may allow you to trade your call sign for one with your initials? _____ p. 203
8. Which page in the book shows me issuing your passing certificate? and tells where to write for that free certificate? _____ p. 208
9. Where, in the book, will you find RF Safety Tables? _____ p. 219
CW abbreviations? _____ p. 223 and
the Element 2 Q&A Cross Reference list? _____ p. 225 & 226
10. Morse code is FUN. What page has the chapter on learning the code? _____ p. 209



Additional Learning Resources

Find other materials perfect for your exam preparation or to continue your education after you receive your Technician class license. Available from ARRL at 860-594-0200 or www.arrl.org/shop.

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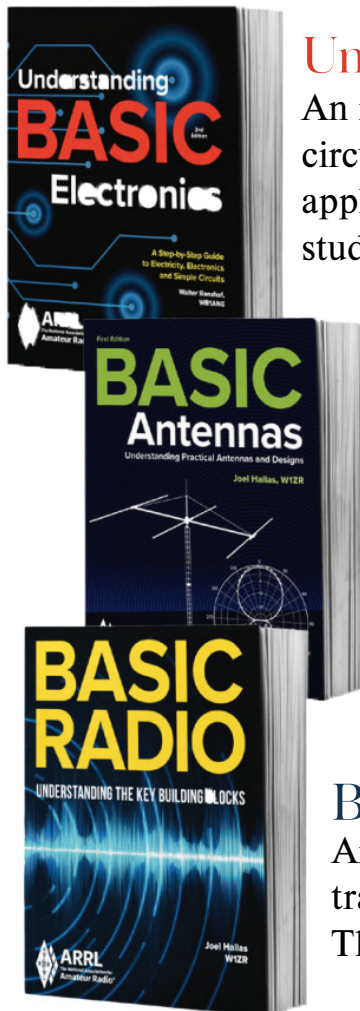
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