

**2022-2026 Technician Class
FCC Element 2 Question Pool
Effective 7/01/2022 – 6/30/2026**

SUBELEMENT T7 – PRACTICAL CIRCUITS – [4 Exam Questions - 4 Groups]

T7A – Station equipment: receivers, transceivers, transmitter amplifiers, receive amplifiers, transverters;
Basic radio circuit concepts and terminology: sensitivity, selectivity, mixers, oscillators, PTT, modulation

T7A01

Which term describes the ability of a receiver to detect the presence of a signal?

- A. Linearity
- B. Sensitivity**
- C. Selectivity
- D. Total Harmonic Distortion

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T7A02

What is a transceiver?

- A. A device that combines a receiver and transmitter**
- B. A device for matching feed line impedance to 50 ohms
- C. A device for automatically sending and decoding Morse code
- D. A device for converting receiver and transmitter frequencies to another band

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T7A03

Which of the following is used to convert a signal from one frequency to another?

- A. Phase splitter
- B. Mixer**
- C. Inverter
- D. Amplifier

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T7A04

Which term describes the ability of a receiver to discriminate between multiple signals?

- A. Discrimination ratio
- B. Sensitivity
- C. Selectivity**
- D. Harmonic distortion

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T7A05

What is the name of a circuit that generates a signal at a specific frequency?

- A. Reactance modulator
- B. Phase modulator
- C. Low-pass filter
- D. Oscillator**

T7A06

What device converts the RF input and output of a transceiver to another band?

- A. High-pass filter
- B. Low-pass filter
- C. Transverter
- D. Phase converter

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T7A07

What is the function of a transceiver's PTT input?

- A. Input for a key used to send CW
- B. Switches transceiver from receive to transmit when grounded
- C. Provides a transmit tuning tone when grounded
- D. Input for a preamplifier tuning tone

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T7A08

Which of the following describes combining speech with an RF carrier signal?

- A. Impedance matching
- B. Oscillation
- C. Modulation
- D. Low-pass filtering

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T7A09

What is the function of the SSB/CW-FM switch on a VHF power amplifier?

- A. Change the mode of the transmitted signal
- B. Set the amplifier for proper operation in the selected mode
- C. Change the frequency range of the amplifier to operate in the proper segment of the band
- D. Reduce the received signal noise

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T7A10

What device increases the transmitted output power from a transceiver?

- A. A voltage divider
- B. An RF power amplifier
- C. An impedance network
- D. All these choices are correct

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T7A11

Where is an RF preamplifier installed?

- A. Between the antenna and receiver
- B. At the output of the transmitter power amplifier
- C. Between the transmitter and the antenna tuner
- D. At the output of the receiver audio amplifier

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T7B – Symptoms, causes, and cures of common transmitter and receiver problems: overload and overdrive, distortion, interference and consumer electronics, RF feedback

T7B01

What can you do if you are told your FM handheld or mobile transceiver is over-deviating?

- A. Talk louder into the microphone
- B. Let the transceiver cool off
- C. Change to a higher power level
- D. Talk farther away from the microphone

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T7B02

What would cause a broadcast AM or FM radio to receive an amateur radio transmission unintentionally?

- A. The receiver is unable to reject strong signals outside the AM or FM band
- B. The microphone gain of the transmitter is turned up too high
- C. The audio amplifier of the transmitter is overloaded
- D. The deviation of an FM transmitter is set too low

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T7B03

Which of the following can cause radio frequency interference?

- A. Fundamental overload
- B. Harmonics
- C. Spurious emissions
- D. All these choices are correct

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T7B04

Which of the following could you use to cure distorted audio caused by RF current on the shield of a microphone cable?

- A. Band-pass filter
- B. Low-pass filter
- C. Preamplifier
- D. Ferrite choke

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T7B05

How can fundamental overload of a non-amateur radio or TV receiver by an amateur signal be reduced or eliminated?

- A. Block the amateur signal with a filter at the antenna input of the affected receiver
- B. Block the interfering signal with a filter on the amateur transmitter
- C. Switch the transmitter from FM to SSB
- D. Switch the transmitter to a narrow-band mode

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T7B06

Which of the following actions should you take if a neighbor tells you that your station's transmissions are interfering with their radio or TV reception?

- A. Make sure that your station is functioning properly and that it does not cause interference to your own radio or television when it is tuned to the same channel
- B. Immediately turn off your transmitter and contact the nearest FCC office for assistance
- C. Install a harmonic doubler on the output of your transmitter and tune it until the interference is eliminated
- D. All these choices are correct

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T7B07

Which of the following can reduce overload of a VHF transceiver by a nearby commercial FM station?

- A. Installing an RF preamplifier
- B. Using double-shielded coaxial cable
- C. Installing bypass capacitors on the microphone cable
- D. Installing a band-reject filter

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T7B08

What should you do if something in a neighbor's home is causing harmful interference to your amateur station?

- A. Work with your neighbor to identify the offending device
- B. Politely inform your neighbor that FCC rules prohibit the use of devices that cause interference
- C. Make sure your station meets the standards of good amateur practice
- D. All these choices are correct

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T7B09

What should be the first step to resolve non-fiber optic cable TV interference caused by your amateur radio transmission?

- A. Add a low-pass filter to the TV antenna input
- B. Add a high-pass filter to the TV antenna input
- C. Add a preamplifier to the TV antenna input
- D. Be sure all TV feed line coaxial connectors are installed properly

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T7B10

What might be a problem if you receive a report that your audio signal through an FM repeater is distorted or unintelligible?

- A. Your transmitter is slightly off frequency
- B. Your batteries are running low
- C. You are in a bad location
- D. All these choices are correct

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T7B11

What is a symptom of RF feedback in a transmitter or transceiver?

- A. Excessive SWR at the antenna connection
- B. The transmitter will not stay on the desired frequency
- C. Reports of garbled, distorted, or unintelligible voice transmissions
- D. Frequent blowing of power supply fuses

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T7C – Antenna and transmission line measurements and troubleshooting: measuring SWR, effects of high SWR, causes of feed line failures; Basic coaxial cable characteristics; Use of dummy loads when testing

T7C01

What is the primary purpose of a dummy load?

- A. To prevent transmitting signals over the air when making tests
- B. To prevent over-modulation of a transmitter
- C. To improve the efficiency of an antenna
- D. To improve the signal-to-noise ratio of a receiver

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T7C02

Which of the following is used to determine if an antenna is resonant at the desired operating frequency?

- A. A VTVM
- B. An antenna analyzer
- C. A Q meter
- D. A frequency counter

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T7C03

What does a dummy load consist of?

- A. A high-gain amplifier and a TR switch
- B. A non-inductive resistor mounted on a heat sink
- C. A low-voltage power supply and a DC relay
- D. A 50-ohm reactance used to terminate a transmission line

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T7C04

What reading on an SWR meter indicates a perfect impedance match between the antenna and the feed line?

- A. 50:50
- B. Zero
- C. 1:1
- D. Full Scale

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T7C05

Why do most solid-state transmitters reduce output power as SWR increases beyond a certain level?

- A. To protect the output amplifier transistors
- B. To comply with FCC rules on spectral purity
- C. Because power supplies cannot supply enough current at high SWR
- D. To lower the SWR on the transmission line

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T7C06

What does an SWR reading of 4:1 indicate?

- A. Loss of -4 dB
- B. Good impedance match
- C. Gain of +4 dB
- D. Impedance mismatch

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T7C07

What happens to power lost in a feed line?

- A. It increases the SWR
- B. It is radiated as harmonics
- C. It is converted into heat
- D. It distorts the signal

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T7C08

Which instrument can be used to determine SWR?

- A. Voltmeter
- B. Ohmmeter
- C. Iambic pentameter
- D. Directional wattmeter

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T7C09

Which of the following causes failure of coaxial cables?

- A. Moisture contamination
- B. Solder flux contamination
- C. Rapid fluctuation in transmitter output power
- D. Operation at 100% duty cycle for an extended period

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T7C10

Why should the outer jacket of coaxial cable be resistant to ultraviolet light?

- A. Ultraviolet resistant jackets prevent harmonic radiation
- B. Ultraviolet light can increase losses in the cable's jacket
- C. Ultraviolet and RF signals can mix, causing interference
- D. Ultraviolet light can damage the jacket and allow water to enter the cable

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T7C11

What is a disadvantage of air core coaxial cable when compared to foam or solid dielectric types?

- A. It has more loss per foot
- B. It cannot be used for VHF or UHF antennas
- C. It requires special techniques to prevent moisture in the cable
- D. It cannot be used at below freezing temperatures

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T7D – Using basic test instruments: voltmeter, ammeter, and ohmmeter; Soldering

T7D01

Which instrument would you use to measure electric potential?

- A. An ammeter
- B. A voltmeter
- C. A wavemeter
- D. An ohmmeter

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T7D02

How is a voltmeter connected to a component to measure applied voltage?

- A. In series
- B. In parallel
- C. In quadrature
- D. In phase

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T7D03

When configured to measure current, how is a multimeter connected to a component?

- A. In series
- B. In parallel
- C. In quadrature
- D. In phase

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T7D04

Which instrument is used to measure electric current?

- A. An ohmmeter
- B. An electrometer
- C. A voltmeter
- D. An ammeter

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T7D05 Question Removed (section not renumbered)

T7D06

Which of the following can damage a multimeter?

- A. Attempting to measure resistance using the voltage setting
- B. Failing to connect one of the probes to ground
- C. Attempting to measure voltage when using the resistance setting
- D. Not allowing it to warm up properly

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T7D07

Which of the following measurements are made using a multimeter?

- A. Signal strength and noise
- B. Impedance and reactance
- C. Voltage and resistance
- D. All these choices are correct

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T7D08

Which of the following types of solder should not be used for radio and electronic applications?

- A. Acid-core solder
- B. Lead-tin solder
- C. Rosin-core solder
- D. Tin-copper solder

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T7D09

What is the characteristic appearance of a cold tin-lead solder joint?

- A. Dark black spots
- B. A bright or shiny surface
- C. A rough or lumpy surface
- D. Excessive solder

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T7D10

What reading indicates that an ohmmeter is connected across a large, discharged capacitor?

- A. Increasing resistance with time
- B. Decreasing resistance with time
- C. Steady full-scale reading
- D. Alternating between open and short circuit

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T7D11

Which of the following precautions should be taken when measuring in-circuit resistance with an ohmmeter?

- A. Ensure that the applied voltages are correct
- B. Ensure that the circuit is not powered
- C. Ensure that the circuit is grounded
- D. Ensure that the circuit is operating at the correct frequency

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