Technician Licensing Class

Amateur radio practices and station setup

T4A - T4B

Valid
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updated to 2018 Question Pool by NQ4K for Sterling Park Amateur Radio Club

T 4 A

- Station setup:
  - connecting microphones;
  - reducing unwanted emissions;
  - power source;
  - connecting a computer;
  - RF grounding;
  - connecting digital equipment;
  - connecting an SWR meter

T 4 A

- The following must be considered to determine the minimum current capacity needed for a transceiver power supply.
  - Efficiency of the transmitter at full power output
  - Receiver and control circuit power
  - Power supply regulation and heat dissipation T4A01

T 4 A

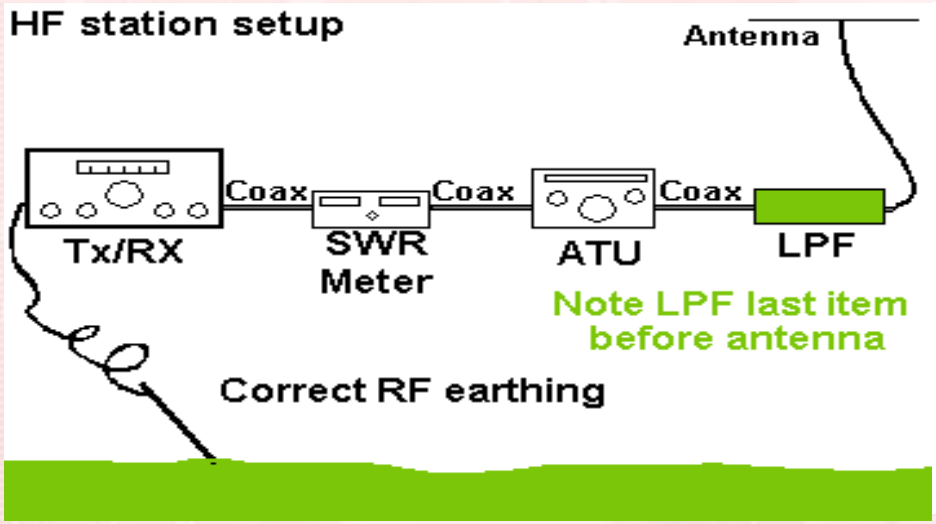
- Computers might be used as part of an amateur radio station:
  - For logging contacts and contact information
  - For sending and/or receiving CW
  - For generating and decoding digital signals T4A02

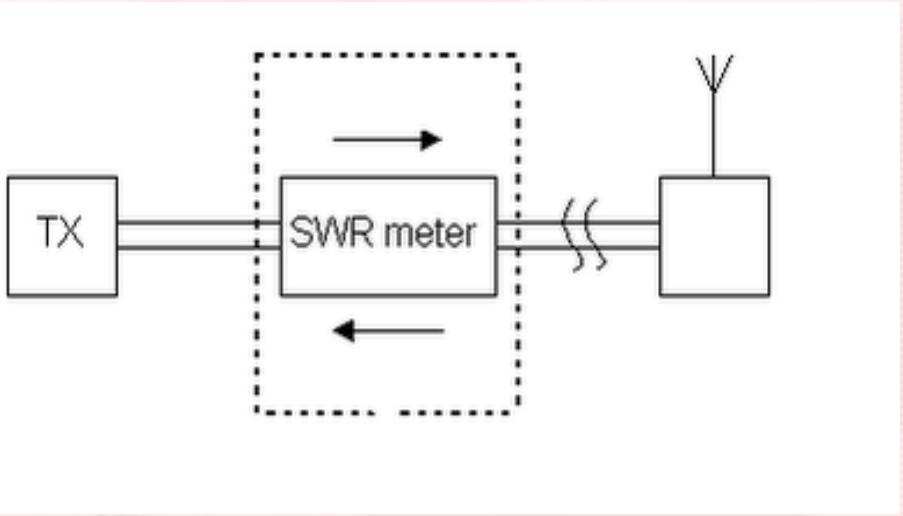
T 4 A

- Wiring between the power source and radio be heavy-gauge wire and kept as short as possible to avoid voltage falling below that needed for proper operation . T4A03
- The transceiver’s headphone or speaker output is connected to a computer’s microphone or line input for operating digital modes T4A04

T 4 A

- An external standing wave ratio (SWR) meter may be located in series with the feed line, between the transmitter and antenna. T4A05





T 4 A

- Receive audio, transmit audio, and push-to-talk (PTT) connections might be used between a voice transceiver and a computer for digital operation. T4A06

- When conducting digital communications using a computer the sound card provides audio to the microphone input and converts received audio to digital form. T4A07

T 4 A

- The flat strap type of conductor is the best to use for RF grounding. T4A08

- Use a ferrite choke to cure distorted audio caused by RF current flowing on the shield of a microphone cable. T4A09

T 4 A

- A source of a high-pitched whine that varies with engine speed in a mobile transceiver's receive audio is the alternator. T4A10

- The negative return connection of a mobile transceiver power cable should be connected at the battery or engine block ground strap. T4A11

T 4 B

- Operating controls:
  - tuning;
  - use of filters;
  - squelch function;
  - AGC;
  - transceiver operation;
  - memory channels

T 4 B

- If a transmitter is operated with the microphone gain set too high the output signal might become distorted T4B01
- A keypad or VFO knob can be used to enter the operating frequency on a modern transceiver. T4B02

- The squelch control on a transceiver will mute the receiver output noise when no signal is being received. T4B03

Run Some Interference Protection

- Storing popular frequencies in a memory channel is a way to enable quick access to a favorite frequency on your transceiver. T4B04
- To reduce ignition interference to a receiver turn on the noise blanker. T4B05

Not on common FM handheld or mobile FM radios.

On bigger high-frequency, multi-mode transceiver.

NB – Noise Blanker

T 4 B

- The receiver incremental tuning (RIT) or clarifier controls could be used if the voice pitch of a single-sideband signal seems too high or low. T4B06

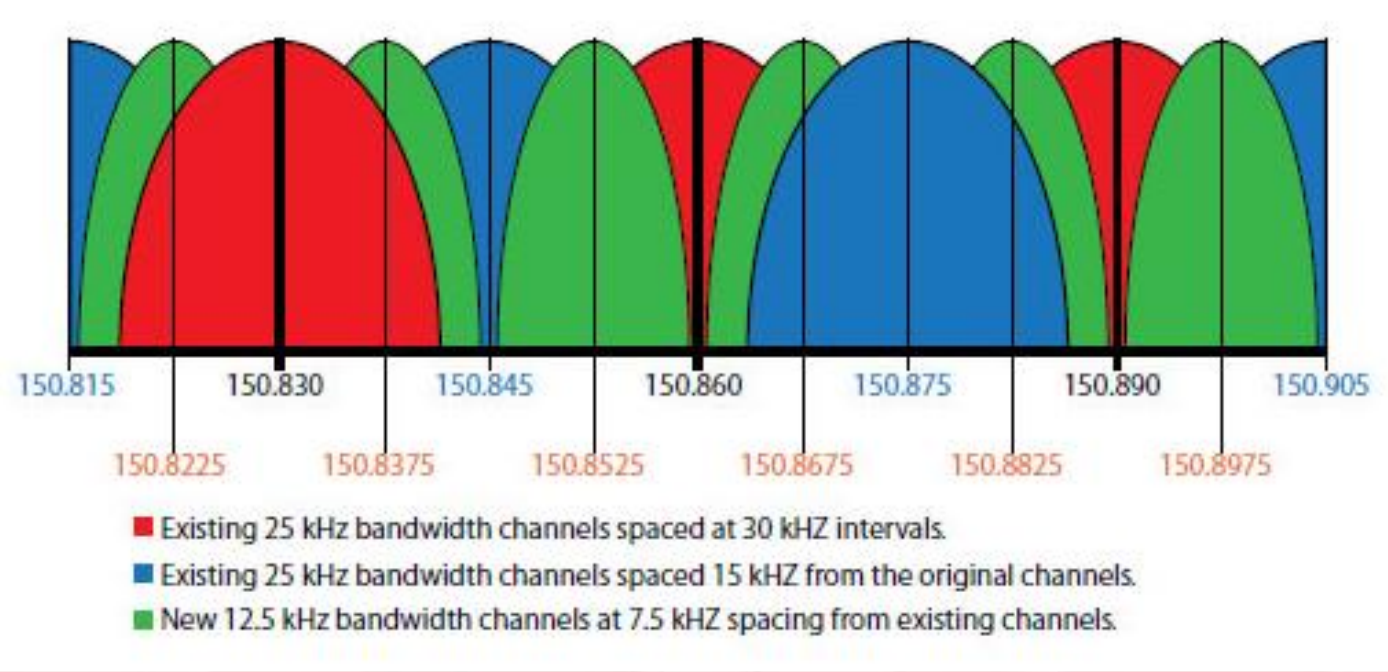
- "RIT" means Receiver Incremental Tuning. T4B07

Set knob to neutral, press RIT button to turn on function, and then adjust slightly for proper SSB voice reception

RIT adjusts voice pitch, not the frequency of received station.

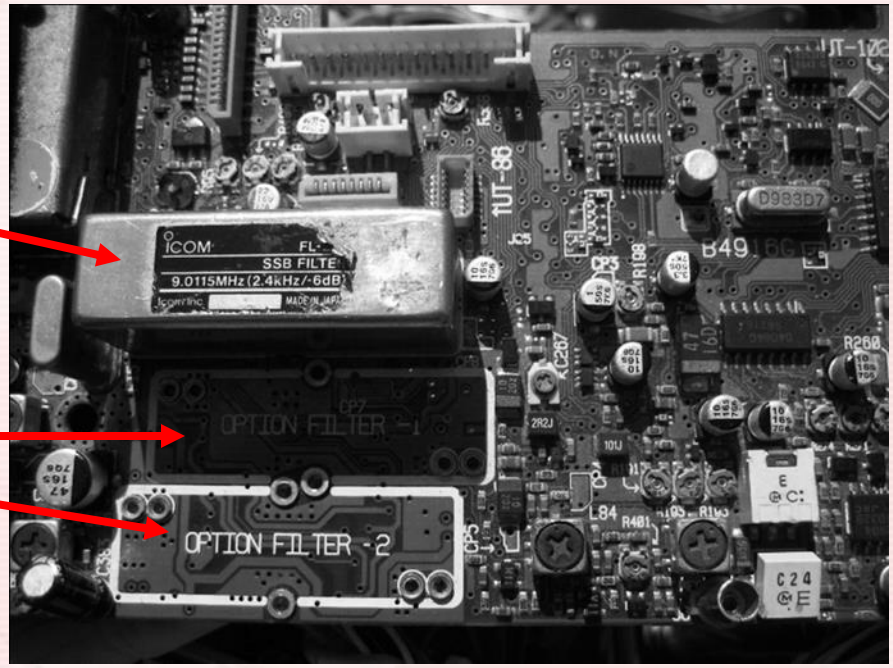
T 4 B

- The advantage of having multiple receive bandwidth choices on a multimode transceiver is that it permits noise or interference reduction by selecting a bandwidth matching the mode. T4B08



T 4 B

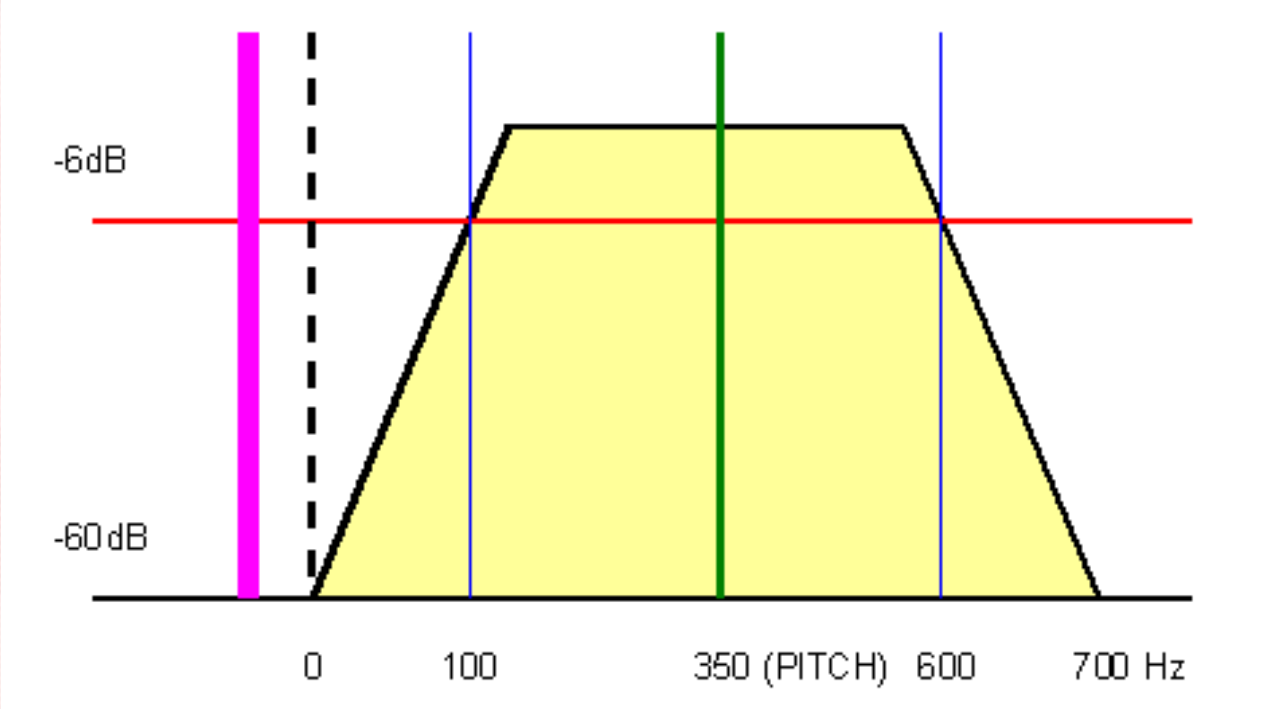
- 2400 Hz is an appropriate receive filter bandwidth to select in order to minimize noise and interference for SSB reception. T4B09



Receiver section in a communications transceiver

T 4 B

- 500 Hz is an appropriate receive filter bandwidth to select in order to minimize noise and interference for CW reception. T4B10



T 4 B

- The function of automatic gain control or AGC is to keep received audio relatively constant. T4B11

- The following could be used to remove power line noise or ignition noise:
  - Squelch
  - Noise blanker
  - Notch filter T4B12

Element 2 Technician Class Question Pool

T 4 A – T 4 B

T4A01 What must be considered to determine the minimum current capacity needed for a transceiver power supply?

A. Efficiency of the transmitter at full power output

B. Receiver and control circuit power

C. Power supply regulation and heat dissipation

D. All of these choices are correct

T4A02 How might a computer be used as part of an amateur radio station?

A. For logging contacts and contact information

B. For sending and/or receiving CW

C. For generating and decoding digital signals

D. All of these choices are correct

T4A03 Why should wiring between the power source and radio be heavy-gauge wire and kept as short as possible?

A. To avoid voltage falling below that needed for proper operation

B. To provide a good counterpoise for the antenna

C. To avoid RF interference

D. All of these choices are correct

T4A04 Which computer sound card port is connected to a transceiver's headphone or speaker output for operating digital modes?

A. Headphone output

B. Mute

C. Microphone or line input

D. PCI or SDI

T4A05 What is the proper location for an external SWR meter?

A. In series with the feed line, between the transmitter and antenna

B. In series with the station's ground

C. In parallel with the push-to-talk line and the antenna

D. In series with the power supply cable, as close as possible to the radio

T4A06 Which of the following connections might be used between a voice transceiver and a computer for digital operation?

A. Receive and transmit mode, status, and location

B. Antenna and RF power

C. Receive audio, transmit audio, and push-to-talk (PTT)

D. NMEA GPS location and DC power

T4A07 How is the computer's sound card used when conducting digital?

A. The sound card communicates between the computer CPU and the video display

B. The sound card records the audio frequency for video display

C. The sound card provides audio to the microphone input and converts received audio to digital form

D. All of these choices are correct

T4A08 Which of the following conductors provides the lowest impedance to RF signals?

A. Round stranded wire

B. Round copper-clad steel wire

C. Twisted-pair cable

D. Flat strap

T4A09 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

T4A10 What is the source of a high-pitched whine that varies with engine speed in a mobile transceiver's receive audio?

A. The ignition system

B. The alternator

C. The electric fuel pump

D. Anti-lock braking system controllers

T4A11 Where should the negative return connection of a mobile transceiver's power cable be connected?

A. At the battery or engine block ground strap

B. At the antenna mount

C. To any metal part of the vehicle

D. Through the transceiver's mounting bracket

T4B01 What may happen if a transmitter is operated with the microphone gain set too high?

A. The output power might be too high

B. The output signal might become distorted

C. The frequency might vary

D. The SWR might increase

T4B02 Which of the following can be used to enter the operating frequency on a modern transceiver?

A. The keypad or VFO knob

B. The CTCSS or DTMF encoder

C. The Automatic Frequency Control

D. All of these choices are correct

T4B03 What is the purpose of the squelch control on a transceiver?

A. To set the highest level of volume desired

B. To set the transmitter power level

C. To adjust the automatic gain control

D. To mute receiver output noise when no signal is being received

T4B04 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

T4B05 Which of the following would reduce ignition interference to a receiver?

A. Change frequency slightly

B. Decrease the squelch setting

C. Turn on the noise blanker

D. Use the RIT control

T4B06 Which of the following controls could be used if the voice pitch of a single-sideband signal seems too high or low?

A. The AGC or limiter

B. The bandwidth selection

C. The tone squelch

D. The receiver RIT or clarifier

T4B07 What does the term "RIT" mean?

A. Receiver Input Tone

B. Receiver Incremental Tuning

C. Rectifier Inverter Test

D. Remote Input Transmitter

T4B08 What is the advantage of having multiple receive bandwidth choices on a multimode transceiver?

A. Permits monitoring several modes at once

B. Permits noise or interference reduction by selecting a bandwidth matching the mode

C. Increases the number of frequencies that can be stored in memory

D. Increases the amount of offset between receive and transmit frequencies

T4B09

Which of the following is an appropriate receive filter bandwidth for minimizing noise and interference for SSB reception?

A. 500 Hz

B. 1000 Hz

C. 2400 Hz

D. 5000 Hz

T4B10

Which of the following is an appropriate receive filter bandwidth for minimizing noise and interference for CW reception?

A. 500 Hz

B. 1000 Hz

C. 2400 Hz

D. 5000 Hz

T4B11 What is the function of automatic gain control, or AGC?

A. To keep received audio relatively constant

B. To protect an antenna from lightning

C. To eliminate RF on the station cabling

D. An asymmetric goniometer control used for antenna matching

T4B12 Which of the following could be used to remove power line noise or ignition noise?

A. Squelch

B. Noise blanker

C. Notch filter

D. All of these choices are correct

T4B13 Which of the following is a use for the scanning function of an FM transceiver?

A. To check incoming signal deviation

B. To prevent interference to nearby repeaters

C. To scan through a range of frequencies to check for activity

D. To check for messages left on a digital bulletin board