Technician Licensing Class

Your Computer Goes Ham Digital!

Presented by
ELEMENT 2 SUB-ELEMENTS
(Groupings)

- About Ham Radio
- Call Signs
- Control
- Mind the Rules
- Tech Frequencies
- Your First Radio
- Going On The Air!
- Repeaters
- Emergency!
- Weak Signal Propagation
Amateur Radio Technician Class
Element 2 Course Presentation

**ELEMENT 2 SUB-ELEMENTS** (Groupings)

- Talk to Outer Space!
- Your Computer Goes Ham Digital!
- Multi-Mode Radio Excitement
- Run Some Interference Protection
- Electrons – Go With the Flow!
- It’s the Law, per Mr. Ohm!
- Go Picture These!
- Antennas
- Feed Me with Some Good Coax!
- Safety First!
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- **T8D9** The code used when sending CW in the amateur bands is International Morse.

- **T8D10** The following devices can be used to transmit CW in the amateur bands:
  - Straight Key
  - Electronic Keyer
  - Computer Keyboard

- **T8D1** The following are examples of digital communications methods.
  - Packet
  - PSK31
  - MFSK

All of these choices are correct.
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- T4A6 A terminal node controller would be connected between a transceiver and computer in a packet radio station.

![Diagram of Packet Radio System](A Packet Radio System)

![Packet Equipment](Some Packet equipment)
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- **T4A7** The sound card provides audio to the microphone input and converts received audio to digital form when conducting digital communications using a computer.

- **T8D8** Packet transmissions may include:
  - A check sum which permits error detection;
  - A header which contains the call sign of the station to which the information is being sent;
  - Automatic repeat request in case of error.

Laptop, TNC, and Handheld comprise Packet Station.

All of these choices are correct.
A "parity" bit is an extra code element used to detect errors in received data.
   - Just like a ‘parity bit’ in computers

When applied to digital communications systems, the acronym "BER" means Bit Error Rate.

Error rates are likely to increase on VHF or UHF data signals propagated over multiple paths.

A commonly used method of sending signals to and from a digital satellite is FM Packet.
   - FM packet a very popular digital communications system
   - Packets usually stored and forwarded, via satellite or space station
The term APRS means **Automatic Position Reporting System**.
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- **T8D3** A Global Positioning System receiver is normally used when sending automatic location reports via amateur radio.

- **T8D6** The abbreviation PSK mean Phase Shift Keying.

- **T8D7** PSK31 is a low-rate data transmission mode.
  - PSK-31 transmission rate is about normal typing speed.
  - PSK is a remarkable digital mode that slices through interference and gets message across sometimes to the moon and back.

You can connect a PSK-31 and RTTY data reader to your radio to decode messages.
• **T8C11** A gateway is the name given to an amateur radio station that is used to connect other amateur stations to the Internet.
  • Similar to a Gateway in connection to a computer network
• **T8C9** You might obtain a list of active nodes that use VoIP from a repeater directory.
  • The Internet is your best source. (But this is the question for the exam.)
• **T8C10** You can select a specific IRLP node when using a portable transceiver by use of the keypad to transmit the IRLP node ID.

Keypad on this rig’s top corner and on back of microphone. (Not necessarily this way on all rigs.)
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Cable or DSL connection
Need at least 36 Kb sustained bandwidth for ADPCM or 16 Kb for GSM

Sound Card
Network Card
IRLP Board
LPT1

Low power Link
Radio on mobile
frequencies

PTT to radio
COS from radio
from Speaker to Sound Card Line In
decoder input

IRLP Logic and DTMF Decoder Board

Three normally open MOSFET switches are available for external control
Parallel port connection used to connect PTT to radio, COS from receiver and sending DTMF digits to the IRLP software

Pentium I or better
96M RAM 2G HD

www.irlp.net
for more info
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Linking Example

Station "A"

Station "B"

InternetLink
T8C8  It is required that a label indicating the licensee's name, call sign and address must be affixed to the transmitter in place of on-air station identification when sending signals to a radio control model using amateur frequencies.

- Strange radio control signals can be heard using RC:
  - 50.800 to 51.0 MHz and 53.1 to 53.9 MHz.
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• T8C7  The maximum power allowed when transmitting telecommand signals to radio controlled models is 1 watt.

• Telecommand signals are unidentified commands permitted by rule.

Hams can use frequencies on the 6-Meter Band to radio control a model aircraft.
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- T8D4 The type of transmission indicated by the term NTSC is an analog fast scan color TV signal.

When you’re ready, you can add the fun of ATV to your ham shack.
Element 2 Technician Class Question Pool

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Valid July 1, 2010

Through

June 30, 2014
What code is used when sending CW in the amateur bands?

A. Baudot
B. Hamming
C. International Morse
D. Gray
Which of the following can be used to transmit CW in the amateur bands?

A. Straight Key
B. Electronic Keyer
C. Computer Keyboard
D. All of these choices are correct
Which of the following is an example of a digital communications method?

A. Packet
B. PSK31
C. MFSK
D. All of these choices are correct
Which of the following would be connected between a transceiver and computer in a packet radio station?

A. Transmatch
B. Mixer
C. Terminal node controller
D. Antenna
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
Which of the following may be included in packet transmissions?

A. A check sum which permits error detection
B. A header which contains the call sign of the station to which the information is being sent
C. Automatic repeat request in case of error
D. All of these choices are correct
What is a "parity" bit?

A. A control code required for automatic position reporting
B. A timing bit used to ensure equal sharing of a frequency
C. An extra code element used to detect errors in received data
D. A "triple width" bit used to signal the end of a character
What does the acronym "BER" mean when applied to digital communications systems?

A. Baud Enhancement Recovery  
B. Baud Error Removal  
C. Bit Error Rate  
D. Bit Exponent Resource
What may occur if VHF or UHF data signals propagate over multiple paths?

A. Transmission rates can be increased by a factor equal to the number of separate paths observed
B. Transmission rates must be decreased by a factor equal to the number of separate paths observed
C. No significant changes will occur if the signals are transmitting using FM
D. Error rates are likely to increase
What is a commonly used method of sending signals to and from a digital satellite?

A. USB AFSK
B. PSK31
C. FM Packet
D. WSJT
T8D02 What does the term APRS mean?

A. Automatic Position Reporting System
B. Associated Public Radio Station
C. Auto Planning Radio Set-up
D. Advanced Polar Radio System
Which of the following is normally used when sending automatic location reports via amateur radio?

A. A connection to the vehicle speedometer
B. A WWV receiver
C. A connection to a broadcast FM sub-carrier receiver
D. A Global Positioning System receiver
What does the abbreviation PSK mean?

A. Pulse Shift Keying
B. Phase Shift Keying
C. Packet Short Keying
D. Phased Slide Keying
What is PSK31?

A. A high-rate data transmission mode
B. A method of reducing noise interference to FM signals
C. A method of compressing digital television signal
D. A low-rate data transmission mode
What name is given to an amateur radio station that is used to connect other amateur stations to the Internet?

A. A gateway
B. A repeater
C. A digipeater
D. A beacon
How might you obtain a list of active nodes that use VoIP?

A. From the FCC Rulebook
B. From your local emergency coordinator
C. From a repeater directory
D. From the local repeater frequency coordinator
How do you select a specific IRLP node when using a portable transceiver?

A. Choose a specific CTCSS tone
B. Choose the correct DSC tone
C. Access the repeater autopatch
D. Use the keypad to transmit the IRLP node ID
What is required in place of on-air station identification when sending signals to a radio control model using amateur frequencies?

A. Voice identification must be transmitted every 10 minutes
B. Morse code ID must be sent once per hour
C. A label indicating the licensee's name, call sign and address must be affixed to the transmitter
D. A flag must be affixed to the transmitter antenna with the station call sign in 1 inch high letters or larger
What is the maximum power allowed when transmitting telecommand signals to radio controlled models?

A. 500 milliwatts
B. 1 watt
C. 25 watts
D. 1500 watts
What type of transmission is indicated by the term NTSC?

A. A Normal Transmission mode in Static Circuit
B. A special mode for earth satellite uplink
C. An analog fast scan color TV signal
D. A frame compression scheme for TV signals