

Radio Teacher Technician Test Subelement T6 Notes

These notes cover the information needed to answer the questions on Subelement T6 of the Amateur Radio Technician Test. They can be used by instructors as a reference to make sure that all of the information in this subelement is addressed in class.

Subelement T6 covers different phone (voice) and data modes of communication such as Amplitude Modulation (AM), Frequency Modulation (FM), Single Side Band (SSB), linking systems over the Internet, data communications and image communications.

Single Side Band:

All voice transmissions by radio are “phone” transmissions

Single sideband is a form of amplitude modulation.

Single Side Band (SSB) is the most often used for long distance and weak signal contacts on the VHF and UHF bands. The primary advantage of single sideband over FM for voice transmissions is that SSB signals use much less bandwidth than FM signals.

Upper sideband is normally used for VHF and UHF SSB communications. Between 2 and 3 kHz is the approximate bandwidth of a single-sideband voice signal.

Frequency Modulation:

Frequency Modulation (FM) is most commonly used for VHF and UHF voice repeaters. The approximate bandwidth of a frequency-modulated voice signal is between 5 and 15 kHz.

Bandwidth:

The normal bandwidth required for a conventional fast-scan TV transmission using combined video and audio on the 70-centimeter band is about 6 MHz. This contrasts with CW that is one of the narrowest bandwidth modes, typically about 100 to 250 Hz.

EchoLink:

EchoLink allows computer-to-radio linking for voice transmission. Internet Radio Linking Project (IRLP) is a method of linking between two or more amateur stations using the Internet. Typically this is done between repeaters. The repeaters can be across town or around the world.

Echolink information is transmitted between stations using the Internet and can be used by any licensed amateur radio operator.

VoIP:

Both EchoLink and IRLP use Voice over Internet protocol (VoIP) technology.

You can find a list of active nodes using VoIP in a repeater directory or on the Internet.

IRLP:

When using a portable transceiver you can select a specific IRLP node by using the keypad to transmit the IRLP node numbers.

If you hear a brief tone followed by a station from Russia calling CQ on a local 2-meter repeater, the repeater is connected via the Internet to the DX station.

Internet Gateway:

The name given to an amateur radio station that is used to connect other amateur stations to the Internet is a "gateway". This term can be used for APRS, IRLP and many other modes.

Packet Radio:

Packet radio is a great example of a digital communications method. As stated in the T5 notes the Automatic Position Reporting System (APRS) mode can broadcast your location on a regular interval. This information can then be used to coordinate activities of a group such as search and rescue or providing safety information for runners of a race. It was also used to find stolen amateur radio operators cars before commercial products were available.

A global positioning system receiver is required along with your normal radio for sending automatic location reports.

NTSC:

A standard fast scan color television signal is denoted by the standard term of NTSC. NTSC specifies the signal needed to provide a US television picture.

Data modes on 1.25 meters:

Point-to-point digital message forwarding mode may be used by a Technician class operator in the 219 - 220 MHz frequency range.

PSK:

Phase Shift Keying (PSK) denotes a signal that uses a shift in the phase of a signal to transmit data. PSK31 is a low-rate data transmission mode that works well in noisy conditions

Morse Code:

You should not send Morse code faster than the speed that you can reliably receive. A practical reason for being able to copy CW when using repeaters is to decode the ID sent in Morse code.

Q Signals:

The "Q" signal used to indicate that you are receiving interference from other stations is **QRM**.

The "Q" signal used to indicate that you are changing frequency is **QSY**.