

Unit 1.7 Operating Procedures: FM Operation

Once they get their licenses, most Technicians purchase a VHF/UHF FM transceiver. This type of radio allows them to use repeaters and participate in public-service events.

A repeater station is the type of amateur station that simultaneously retransmits the signal of another amateur station on a different channel or channels. (T1F09) Auxiliary, repeater, or space stations can automatically retransmit the signals of other amateur stations. (T1D07)

To use repeaters, you need to know how to set up your radio. Repeaters receive on one frequency and transmit on another. You program your radio so that it receives on the repeater's transmit frequency and transmits on the repeater's receive frequency.

The difference between the transmit frequency and receive frequency is called the repeater frequency offset. Plus or minus 600 kHz is the most common repeater frequency offset in the 2 meter band. (T2A01) Plus or minus 5 MHz is a common repeater frequency offset in the 70 cm band. (T2A03)

Repeater operation is called duplex operation because you're transmitting and receiving on two different frequencies. When the stations can communicate directly without using a repeater, you should consider communicating via simplex rather than a repeater. (T2B12) Simplex communication is the term used to describe an amateur station that is transmitting and receiving on the same frequency. (T2B01)

To help amateurs operating simplex find one another, frequencies on each band have been set aside as "national calling frequencies." 446.000 MHz is the national calling frequency for FM simplex operations in the 70 cm band. (T2A02) 146.52 MHz is the national calling frequency for FM simplex operation in the 2 m band.

Because repeaters often operate in environments where there is a lot of interference, they are programmed not to operate unless the station that's being received is also transmitting a sub-audible tone of a specific frequency. These tones are sometimes called PL (short for "private line") tones or CTCSS (short for "continuous tone-coded squelch system") tones. CTCSS is the term used to describe the use of a sub-audible tone transmitted with normal voice audio to open the squelch of a receiver. (T2B02) If your radio has not been programmed to transmit the proper sub-audible tone when you transmit, the repeater will not repeat your transmission.

All of these choices are correct when talking about common problems that might cause you to be able to hear but not access a repeater even when transmitting with the proper offset: (T2B04)

- The repeater receiver requires audio tone burst for access
- The repeater receiver requires a CTCSS tone for access
- The repeater receiver may require a DCS tone sequence for access

One of the controls on a VHF/UHF transceiver is the squelch control. Carrier squelch is the term that describes the muting of receiver audio controlled solely by the presence or absence of an RF signal. (T2B03) You can set this control so that you only get an audio output when receiving a signal over a set threshold level.

Microphone gain is also an important control. The reason for this is that the amplitude of the modulating signal determines the amount of deviation of an FM signal. (T2B05) When the deviation of an FM transmitter is increased, its signal occupies more bandwidth. (T2B06) One thing that could cause your FM signal to interfere with stations on nearby frequencies is that you have set your microphone gain too high, causing over-deviation. (T2B07)

In addition to knowing how to set the controls of your radio, you need to know the protocol for making contacts. First, when using a repeater, it is rare to hear stations calling CQ. In place of “CQ,” say your call sign to indicate that you are listening on a repeater. (T2A09) An appropriate way to call another station on a repeater, if you know the other station's call sign, is to say the station's call sign then identify with your call sign. (T2A04)

QUESTION POOL: (14)

T1F09	T1D07	T2A01	T2A03	T2B12	T2B01	T2A02
T2B02	T2B03	T2B05	T2B06	T2B07	T2A09	T2A04