Signal

Signal reports for FM operations are normally given in terms of receiver quieting. FM works by modulating or varying the frequency with the input signal and produces a constant amplitude signal. If an FM signal is larger in amplitude at your receiver than any natural or man-made noise, the signal will be *full quieting*. If some of the noise present at your antenna input has a larger amplitude than the desired FM signal, you will hear some *noise.*

Q5	Full quieting, no noise
Q4	Some noise, but can be monitored long term without excessive fatigue
Q3	Significant noise, but can be fully understood with difficulty and with fatigue over time
Q2	Overwhelming noise, some information can be understood, many repeats likely
Q1	Just enough signal to know someone is there. You may recognize the voice.
Q0	No signal present

Another way of looking at this system is by the amount of quieting as a percentage. Sometimes you will hear a report of "75% quieting". The FM "Q" reports can also be thought of this way:

Q5	100% signal, 0% noise
Q4	80% signal, 20% noise
Q3	60% signal, 40% noise
Q2	40% signal, 60% noise
Q1	20% signal, 80% noise
Q0	0% signal, 100% noise

Remember, although guidelines exist, a signal report is still a *subjective report*.

On an **FM repeater**, the listener should have a *full quieting copy on the repeater itself*, which can be determined by listening to the repeater tail, after the courtesy tone before it drops out. The repeater voice and Morse ID will also be useful in determining the signal strength of the repeater.

When giving a signal report, also note any *artifacts* such as picket fencing, wind effects on the antenna or RF feedback which you have attributed to the signal. Some of these may be reported as audio issues. That's okay as long as the report is accurate.

Audio

The **audio characteristics** of the repeater should be considered *before* you give audio reports. Unfortunately, audio from the repeater itself (courtesy beeps, IDs, voice announcements, etc) cannot help you as that audio follows a different path in the repeater and can be set to different levels by the repeater maintainer. Your only option is to consider the average of all stations when forming an opinion about the repeater.

A meaningful **audio** report should include the following:

- Noting any *serious* problem sounds such as AC hum, alternator whine, audio feedback, audio distortion, intermittent dropouts, etc.
- Noting the existence and strength of:
    - Distracting *background noises* (paper shuffling, desk bangs, car door etc)
    - Keying transients
    - Other *strange* sounds that are not part of the transmitting operator's speech.
- A **subjective description** of the *tonal response* of the speech itself, covering *bass, midrange, and treble*.
    - The most important portion for intelligibility is *treble*, or high frequency response. This can be determined by how well you can hear the sibilants and fricatives of the operator's speech. T
        - The strength of the sound of the some representative letters (in approximate order from weakest to strongest) F, D, T, J, S, SH, CH.
    - *Bass* response is somewhat limited by the speech pass band itself, but enough at the 300 Hz end of the pass band is noticeable, especially on headphones.
        - On a mis-aligned repeater, you may hear the sub-audible tone. This also depends on the receiving radio's audio pass-band response.
    - *Midrange* is where most of the speech energy is concentrated, and lack of both midrange and bass will leave very little energy in the pass band, like listening on a tiny (and tinny) speaker.
    - Be careful not to confuse **your radio's receiving audio response**, with that of the transmitting station. You know your radio, and you probably know the natural (or sometimes "radio") voice of at least some transmitting stations.

Station	Report through Repeater	Simplex report	Audio
Repeater			
Net Control (NCS)			
Station 1			
Station 2			
Station 3			
Station 4			
Station 5			
Station 6			
Station 7			
Station 8			
Station 9			
Station 10			
Station 11			
Station 12			
Mobile 1			
Mobile 2			
Mobile 3			
Mobile 4			
Mobile 5			
Portable 1			
Portable 2			
Portable 3			
Portable 4			
Portable 5			

CANS	Slang for RF filters often used in repeater installations. They look like cans.
COURTESY BEEP	The audible beep (or other signal) that occurs after the repeater's timeout timer is reset. Repeater users should pause between transmissions to let this reset occur and to let others break in.
CTCSS	Continuous-Tone-Coded Squelch System, sub-audible tones used for accessing some repeaters. These tones are in the frequency range of 67 Hertz to 250.3 Hertz.
DUPLEX	Operation using a pair of frequencies, one for transmit and one for receive, as when using a repeater.
FM	Frequency Modulation. Modulation technique which places information on a transmitted signal by modulating or varying the frequency.
FULL DUPLEX	Operation using a pair of frequencies, usually on separate bands, allowing simultaneous transmit and receive. A repeater can operate full duplex "in-band" because of the RF filters or "cans"
FULL QUIETING	A received signal having no noise in it.
INPUT FREQUENCY	The frequency on which a repeater listens.
KERCHUNK	To key a repeater without identifying your station. Sometimes used to get the repeater to transmit the tail or ID so you can judge your signal into a repeater or verify transmitted CTCSS tone selection.
MACHINE	Slang for repeater or repeater system.
NCS	Net Control Station
OUTPUT FREQUENCY	The frequency on which a repeater transmits.
PL	Private Line, the Motorola trademarked name for CTCSS.
PICKET FENCING	Flutter. How a signal sounds from a mobile station as your signal reinforces and cancels due to multi-path. This effect can be present if either station is moving or if moving objects are causing multi-path distortion of the signal (such as operating beside a highway).
SIMPLEX	Radio communications using the same transmit and receive frequency (Communication between two stations without the use of a repeater).
TRANSMIT OFFSET	The difference between the repeater user's transmit and receive frequencies. This offset is either + or - 600 kHz on most 2-meter repeaters.
WHITE NOISE	A random signal with a flat or equal power distribution at all frequencies.