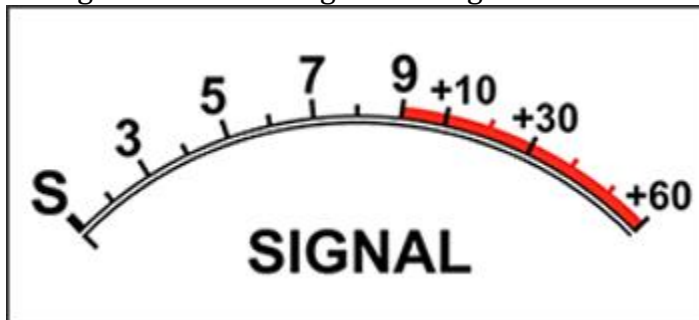


Practical Signal Reports

Everyone wants to know how their signal sounds on the air and often the best way to find out is a signal report from other ham radio operators. The standard signal reporting method for amateur radio is the RST (Readability-Signal Strength-Tone) system (see below).

The best signal report for CW operation is RST 599. The T, or tone factor, refers to the sound qualities of the received CW signal. On phone, we drop the reading for Tone and just give RS reports, so a perfect signal on phone is RS 59 or just "five nine." On the HF bands, you'll typically hear something like this: "your signal report is five nine in central Kansas." If you are good copy, you will usually get a **Five** for Readability (which means "Perfectly Readable"). A **Four** indicates "Readable with practically no difficulty" and **Three** means "Readable with considerable difficulty." Most signal reports are R3 to R5, else the signal is not very readable. (See the scale listed below.)

The Signal Strength usually reflects what the operator is seeing on the S-Meter of his receiver. Of course, with both CW and SSB, the S-Meter will be bouncing around a bit, so some interpretation is required. More importantly, there is considerable variation in S-Meter calibration, so signal reports can vary from radio to radio. (S9 is commonly defined as 50 μ V at the receiver input, with each S unit representing a 6 dB change in signal strength.) A 55 or 57 report indicates that the signal is very readable but the signal strength is not as strong as a 59 signal.



Most S Meters show an extended scale above S9 that is listed in terms of decibels. The scale may be marked with +10 dB, +20 dB, etc. indicating that the signal strength is that much stronger than S9. You'll hear radio amateurs say something like "you are 5 9 plus 20 dB." Or they may just say "you are 20 dB over."

It is common for DX and contest stations to give out "rubber stamp" signal reports. Basically, they are trying to work as many stations as fast as possible and don't want to be bothered with accurate signal reports, so everyone gets a 59 or 599 report. CW operators may extend this further by substituting the letter N for 9, sending the report 5NN. (In Morse Code, N is a much shorter character than 9.) In fact, there is a collection of "cut

numbers” that CW contesters often use to shorten things up: 0 is replaced by T, 5 is replaced by E, etc. An RST 599 report might be sent as ENN.

On VHF FM, signal reports are often given in terms of FM quieting. A strong FM signal is said to “quiet the receiver” since there is virtually no noise present in the received audio. As the signal strength is decreased, noise starts to appear on the received signal. At some signal level, the noise increases dramatically and the signal becomes unreadable. This dramatic increase is called the threshold effect, meaning that FM signals do not gradually fade out, they suddenly crash into the noise. The key idea here is that you want your signal to be strong enough to be above this noise threshold. In terms of a signal report, a strong signal may result in a “full quieting” report. If the signal is less than full quieting, you may hear a report like “90 percent quieting” or “you have about 10% noise”, which both describe the amount of noise present in the signal. If the signal is really noisy, the report might be “50% quieting.”

You will also hear the classic Five Nine signal report on FM, which is basically saying “excellent signal.” While S Meters are often inconsistent on CW/SSB transceivers, they are almost universally poor on FM rigs. Most FM radios just give you an unlabeled bar graph that is only a relative indicator of signal strength. Usually, these are not labeled in terms of S units, so don’t try to interpret them as such. If all of the bars are lit up on your meter, then you might give a report of “your signal is full scale.”

For FM repeater operation, keep in mind that the signal you are receiving is coming from the repeater and not from the other station. So if the other radio ham is fiddling around with his antenna and asking for signal reports, the repeater signal strength is going to remain the same. You may notice that the other station’s signal into the repeater gets more or less noisy, so giving a report on how well he is hitting the repeater is helpful. “Joe, you are full quieting into the repeater.” This is another reason why FM signal reports tend to be in terms of receiver quieting...in linked systems, the signal strength at the transceiver is less important.

One final note is that sometimes the operator on the other end is looking for a more critical evaluation of his signal quality. If he says something about “checking out this new microphone” or “have been working on solving an audio problem”, that may be the clue to spend a little extra time really listening to the signal and providing more comments on how it sounds. For most of us, we don’t actually get to hear our own signal on the air, so it’s very helpful to get quality feedback from other radio amateurs.

-- Bob KØNR

The RST system as listed on the ARRL web site, [Quick Reference Operating Aids](#):

Readability 1 – Unreadable 2 – Barely readable, occasional words distinguishable. 3 – Readable with considerable difficulty. 4 – Readable with practically no difficulty. 5 – Perfectly readable.

Signal Strength 1- Faint signals, barely perceptible. 2- Very weak signals. 3- Weak signals. 4- Fair signals. 5- Fairly good signals. 6- Good signals. 7- Moderately strong signals. 8- Strong signals. 9- Extremely strong signals.

Tone 1- Sixty cycle a.c or less, very rough and broad. 2- Very rough a.c., very harsh and broad. 3- Rough a.c. tone, rectified but not filtered. 4- Rough note, some trace of filtering. 5- Filtered rectified a.c. but strongly ripple-modulated. 6- Filtered tone, definite trace of ripple modulation. 7- Near pure tone, trace of ripple modulation. 8- Near perfect tone, slight trace of modulation. 9- Perfect tone, no trace of ripple or modulation of any kind.