Creating a Communications "Sweet Spot"

By Don Felgenhauer (K7BFL)
October 21, 2012 Revised March 20, 2019
(2 pages)

In order to create an effective radio communications station, **four specific items need to be in place, each competent in their own way**. The items need to converge together in a manner which creates a "sweet spot", from which robust communications will occur.

The four items are Location, Frequency, Equipment, and Skills.

Frequency: The choice what part of the frequency spectrum to use is dependent on the distance between the two stations wanting to communicate with each other, time-of-year, and time-of-day. Knowledge of propagation principles is necessary to make the right choice.

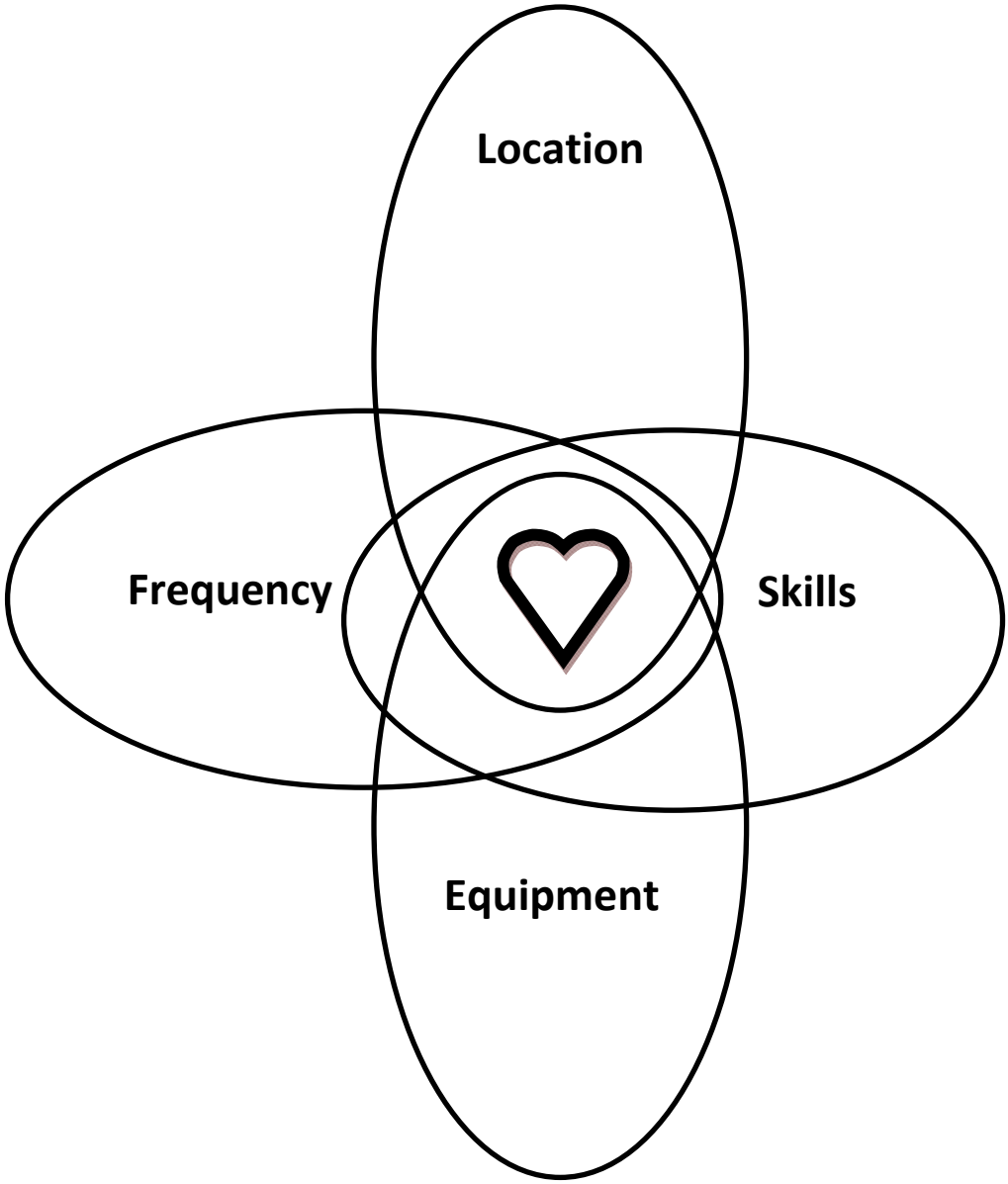
Location: Depending on the frequency choice, a high physical elevation (over surrounding terrain) may be best (for uhf, vhf). A "high elevation" location is not important if a much lower (frequency) part of the spectrum is chosen. Another very important consideration in choosing a physical location is its proximity to electrical "noise" from sources such as electric power equipment, computers, and other radio transmitters. Low "noise" levels are good. High noise levels at or near the level of incoming received signals will cause effective communications to be very poor, or even unusable. Depending on the noise source, physically moving several hundred feet from the source will enable the noise level to be adequately reduced. Equipment must be located where the temperature of components will be within equipment specifications.

Equipment: The transmitter, receiver, antenna, and associated accessory equipment (computer, modem, microphone, etc) must each be independently working to design specifications, and interconnected together properly. The transmit power level must be adequate. The receiver must have adequate sensitivity and ideal selectivity. The equipment voltage supply must be within equipment specifications. The antenna radiating efficiency must be adequate, with ideal polarization.

Skills: The operator of the equipment must have the necessary skills to enable the equipment and software to be used to its maximum capabilities, based on the mode (voice, CW, digital) being used. Skills can be obtained from training (either formal or self-directed) **and** practical experience. It is very important that the operator know how the various other items (Equipment, Frequency, Location) interact with each other. The operator should keep his/her skills at a high level through regular use and practice.

The frequency, location, and equipment choices are also dependent on the physical and electrical parameters used by the "other station"; and the Skills of the other station operator.

By getting the best match for the circumstances it will be possible to obtain a "Sweet Spot". Obtaining this match will result in successful communications between the two stations.


Location
Frequency
Skills
Equipment