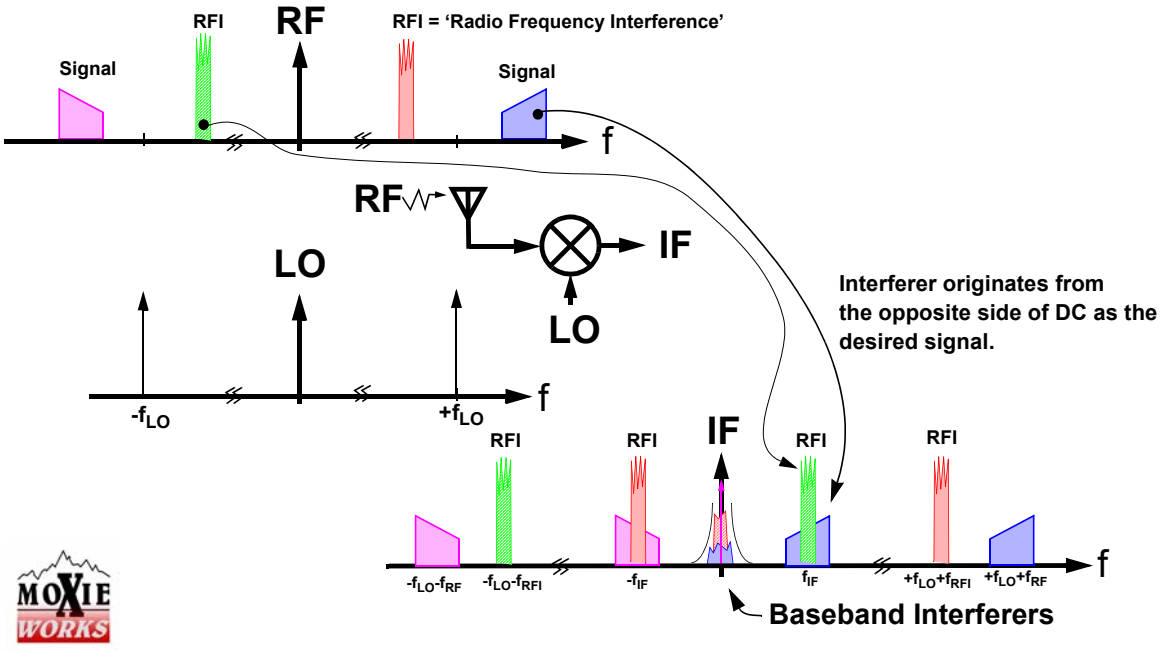
IF's Avoid Baseband Problems

but have an image problem



Downconversion to an IF instead of to DC avoids interferers at and near DC, but creates a new problem (at least when 'real' circuitry is used), namely, energy at the 'image' frequency is folded on top of our desired downconverted output.

It is rarely stated and important to understand that the interfering "image" frequency energy originates from frequencies on the opposite side of DC, as shown in the diagram. Looking ahead, we will find that the advantage of complex radio circuits is that they will downconvert signals only from one side of DC, without downconverting signals (including images) from the opposite side. Image problems are reduced or avoided. More on this later.

For the present, when using real circuits, the only practical method to avoid image interference is prefiltering. (To reduce graphical clutter, the unimportant upconversion frequencies will no longer be explicitly shown in the spectra.)