

## The Stanford University ELF/VLF Receiver

**A** tmospheric  
**W** eather  
**E** lectromagnetic  
**S** ystem for  
**O** bservation  
**M** odeling and  
**E** ducation

### Basic Matlab Scripts

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The following document is intended to describe the use of a set of basic Matlab scripts, for the purpose of quickly plotting/analyzing large amounts of data for easy viewing. These scripts have been written in Matlab 7, but may work in other versions, or if they don't, may only require a small tweak in order to work. These items are provided as is, and the hope is that you may find any one of them useful enough, and you can use it as a base to build your own data analysis tools.

To get started, move all the files in the package to the work directory underneath the Matlab folder. From Matlab, you can run one of five scripts for data analysis, by simply typing its name into Matlab (the other files in the package are just supporting scripts for the five main ones):

1. `vlf_spec` – intended to make a plot and spectrogram of a single segment of time, 30 seconds or less in length.
2. `narrowqplot` – intended to make a single amplitude/phase plot from a single pair of amplitude/phase data files
3. `makespectrograms` – intended to take a longer file of data and create a bunch of two-channel spectrograms of each piece of the data, and saving each spectrogram to a jpeg
4. `makenarrowplots` – intended to take a long narrowband file and create a bunch of plots of each piece of the data, and saving each plot to a jpeg.
5. `soundiscool` – intended to create a .wav sound file from a piece of broadband data

Numbers 1 and 2 are self sufficient – when you run it, you'll be prompted to choose the two relevant files, and for the broadband plotter, you'll pick the length and offset time of the data you want to retrieve (the `narrowqplot` command just uses the entire file by default). The other three Matlab scripts are run by setting up the inputs at the top of the script, and then running it by typing its name into Matlab. Hence, to get started, open up one of those three scripts in Matlab editor. The part you'll want to edit is above the line of `%%%`. Each variable you will have to type in is labeled with instructions of its meaning.