Mystery Signal

Objectives:

- To apply concepts you learned in Labs 1 through 4 to characterize unknown signals.

Prelab:

- In this lab you will be given 60 minutes to characterize all the signals present from an unknown source(s). The signals will be presented to you on a coaxial cable (i.e., you will not be characterizing the airwaves). For the Prelab, you are to write a thorough procedure for this investigation. That is what equipment you will use, what measurements you will make, etc. Expect the signals to be similar to what you investigated in Labs 2 and 4.
- Be sure you capture relevant displays for your report. You will need to use the PSA for this purpose, but use the VSA for the detailed measurements.

Note: once your time begins you will not be allowed to reference anything other than your procedure, so do ensure that it is thorough.

Laboratory Report:

Your lab report should include the following:

1. A two to three page discussion of the laboratory experiment including what were the key concepts demonstrated in the lab, what difficulties (if any) did the team have in performing the experiments (and why?), what was learned that was especially intriguing. The discussion should be written to discuss the signals one by one. The discussion should reference attached data and figures as necessary. Finally, the discussion should provide the following:
   - A well-labeled figure (captured PSA display) for each signal and a detailed discussion on how you used this information to identify the signal.
   - A complete description of each mystery signal in terms of carrier frequency, bandwidth, type of modulation, mod indices, and a description of the baseband signal used to modulate the carrier.
   - Note whether any of the signals observed are related to the others. How might they have been generated.
   - A block diagram of the equipment used to create the signal (best guess based on the information gathered). Provide discussion to explain your figure.
   - Discuss how an oscilloscope would be completely useless in performing the above task.

2. Your Prelab procedure.

3. Attached and well-labeled tables, figures and calculations containing all the data from your experiments.