Now that we've completed the HYSPLIT installation on your computer, we're going to test it, and we're going to start by looking at the graphical user interface operation.

So the graphical user interface has a desktop icon on the Windows system, on a Mac you will need to go to the HYSPLIT4 working directory and start up the GUI through the hysplit4.tcl link. So let's double-click on this and it opens up a welcome menu and at this point we press the green menu button which then opens up the main graphical user interface for HYSPLIT.

Note that underneath this there's a small window, an anchor window that always needs to stay there. You can minimize it, but if you delete it, then it will close the graphical user interface. The main menu consists of four tabs, meteorology, trajectory calculations, air concentration

calculations, and advanced features.

The meteorology tab, if we press here, provides for several different options: the FTP of meteorological data already in HYSPLIT format from the ARL, their NOAA ARL Web server. And there are different kinds of data: forecast data: appended data, but we will actually go into these in more details later on when we look at the meteorology.

The other options are converting meteorological data in different formats to what we call the ARL format which is the format that HYSPLIT reads. And there are ways to display the meteorological data that already in the ARL format and there are various utilities.

I'm not going to be using this, but there is a feature that if you were to click on this dashed line, it separates the menu from the

tab.

The trajectory menu covers different sections of trajectory computations starting with configuring the simulation, running the model, displaying the results, and then various utility programs to convert the trajectory output. There is also a special simulation directory. There will be sections in the tutorial that will cover each of these.

The concentration menu is very similar, we're going to set up, configure simulation, run the model, display the results, and then of course utilities to convert the results. The special concentration simulations access special executables, special executables that are optimized for multi-processor simulations. This would only be applicable right now on a Linux system, if you have compiled it for multi-processor.

The last section is the advanced section, which sort of contains everything else, but more importantly contains some special menus for trajectories and concentrations that change the way the model interprets some of the input data and how it generates of the output files. So you can get kind of a way to control the simulation in these menus. We will be going into those things in a lot more detail later on.

Now let's look at the basic model operation, just to understand what's happening. There are three steps involved for doing trajectories or air concentration calculations. The first step is setting up the run. I will click on this and you can see I will explain the menu options in more detail later on. The general operation here is that we set up the starting time of the simulation, the starting location, how long we want to go, the duration of the calculation, the direction, forward or

backward, the kind of, how the vertical motion is handled. There are different options and the meteorology, and the name of the output file, where the trajectory end points are written and then the meteorology file that's being used. The trajectory dispersion calculations rely on the meteorological data.

At this point, I didn't say, but if you click the save button, it writes a special file called default_traj and those files are written in the working directory. Then when you run the model, what happens when the model runs, it reads that file, the default_traj and copies it to a file named CONTROL, which then the model reads to do the trajectory calculation. It writes the output file, as we saw here in this case, to a file called tdump.

Then when you do the Display for the trajectory, it will read the tdump file, create a Postscript graphical file, that will be in this

directory called trajplot.ps … and there we get our results. Now at this point you may get a little mini message that says that you haven't paid the developers of Ghostview, and that message will always come up until you make a contribution and then the message disappears when they give you a code number. It’s Shareware.

The last thing I want to mention is that when you have, there's some hints for the for the graphical user interface, you want to avoid having multiple windows open at the same time. What I mean by that is for instance, you might have a trajectory window open or maybe a display window open at the same time. You should stick with one window at a time and the reason is that there may be conflicts between variable names that are used in the graphical user interface, so that the same variable name may be used in different ways in multiple windows. We've tried to

correct this wherever we found a problem but occasionally there are still problems. So it's best to only have one window open at a time. And the other thing is that it’s best to use the close button here rather than the X at the top. It is best to keep this within the context of the TCL commands.

The other point is sometimes there will be problems with the menu. Perhaps variable names have been overwritten. When we do this workshop and we do the exercises, it's not like a normal use of HYSPLIT because we're going through multiple simulations, one after another, changing many different things without really closing the graphical user interface and most of the time that works just fine but occasionally we do get into trouble. If you’re getting to a point where things are happening that you don't understand, something is wrong with the graphical user interface, just exit out and start up again. That will reset all the

variables within the graphical user interface.

So how does the model work? I mentioned it briefly that there are several, three steps involved in doing the calculation. In the setup step what we're doing is we're creating a CONTROL file which has the commands for the model to read and then in the case of the trajectory calculations, this is the first column here, the executable program for the trajectory calculation is hyts for HYSPLIT Trajectories Single processor STanDard version. So that is the executable that would be found in the exec directory and that, when you start up the program, when you hit Run, Run HYSPLIT reads this CONTROL file, which has all the starting information and we're going to review the details in those files in a little while.

And then when the model runs it does several things, it writes out a configuration

file with some special parameters that the model defaults to. It also writes out a MESSAGE file so you can track your progress, and then it writes out the ASCII, in this case, the ASCII trajectory endpoints file, which we decided to call tdump. That tdump file is then read by the trajectory plotting program when we do the display step and the trajectory plotting program will create a file called trajplot.ps.

Notice in orange there are some special file names. These are files that are used by the GUI. When you are editing information in the GUI, it actually writes to a file called default_traj. And when you click the run button, it copies default_traj to CONTROL, which is then read by the executable. The executable also generates some output information, such as traj_cfg which is used in the advanced menus. That gets read in the advanced menu section. I will be going over that later on.

The trajectory plotting program, when you set up the display, it generates an output file called a default_tplot, not the trajectory program, but the display menu, so that when you reopen the GUI, it reads this and it knows the settings that were used to generate the plot.

So that's the basic flow chart for the graphical user interface and that completes this particular section.