Cross-Country Planning

Use your NavLog Sheet and these instructions to plan you flight. On the NavLog sheet remember rows are horizontal and columns are vertical. You will also need a chart, pencil, plotter, flight computer and possibly a calculator.

The following steps can be completed days before the flight. Weather information will be needed for additional steps described later.

1. Select your course based on mountains, VORs, airspace and most direct route.
    a. If there are large mountains please don't plan on flying through them or climbing to 13,000 feet to go above them especially if your plane cannot fly that high. It is often much easier to go around them.
    b. Going from VOR to VOR can be helpful to avoid getting off course.
    c. There is no need to avoid Class C airspace but you may want to circumnavigate Class B if you are not sure if you will be cleared to enter.
2. Draw your course line on the chart with a pencil.
3. Decide you cruise altitude based on terrain, and safe clearance altitudes
4. Determine your TOC or top of climb. This will be your first leg of the flight.
    a. Use the TOC chart or table located in your POH
    b. Follow the instructions and use the example to determine your time fuel and distance to climb
5. Measure the determined distance from departure airport to TOC and mark it visibly on your chart.
6. Begin to fill in your navlog:
    a. First checkpoint is departure airport
    b. Second checkpoint is TOC or a easy landmark near TOC
7. The first leg or row of your navlog is very different than the following legs because you are climbing and therefore speeds and fuel burn will be different
    a. Fill in the distance, ETE or estimated time enroute, and fuel burned on the first leg using the information from the TOC chart
8. Now select the rest of your checkpoints along your route.
    a. They should be about 10 miles apart and easy to see from the air (water, airports, freeway intersections).
    b. Any turn along the route also needs to be a checkpoint
9. Measure the distances between checkpoints and log them in the corresponding distance boxes.
    a. Make sure to use the correct scale on the plotter
10. Determine the direction of each leg using the plotter and log that heading in the TC box for true course. (hint: if you don't turn the heading shouldn't change)
11. Skip the WCA and TH boxes. Wind is needed to figure these out and that will happen the day of the flight.
12. Under TH is var. for magnetic variation. This is the difference between true north and magnetic north found on the isogonic lines (magenta dashed lines diagonally across the chart).

a. Log the variation in the corresponding box. In Los Angeles is is close to 14 degrees East or -14. The minus is regardless of the heading of the aircraft.

13. Under MH is dev. or magnetic deviation. This refers to the errors in each individual magnetic compass in each airplane.
    a. Because each airplane is different and the error is never more than a degree or two, you can treat the deviation as 0.

14. Last but not least, airspeed.
    a. In aviation there is IAS, CAS, TAS, and GS (indicated, calibrated, true, and ground speed). Indicated air speed is what you read on the instrument, calibrated is IAS corrected for instrument error (never more than a knot or two, found in the POH), and TAS is dependent on temperature and altitude.
    b. Using the POH determine your CAS based on power settings
    c. Calculate TAS using the front of the flight computer. In the middle right section it says airspeed and density altitude correction. In the tiny window to the right, line up the temperature and the altitude. Then read the true airspeed on the dial opposite CAS.
    d. Your first row/log the airspeed will be Vy or cruise climb because we are climbing to our first checkpoint. The following rows/legs should indicate the TAS determined using the flight computer.

Congrats that's all you can do so far. The day of your flight please complete the following instructions to finish your navigation log.

1. Get a weather briefing and make sure to get the winds aloft forecast and log that wind in the navlog sheet
    a. Winds are provided for Ontario, Landcaster, Santa Barbara, and San Diego. Choose the area closest to the various sections of your flight.
    b. Example: if flying to San Diego use Ontario's winds until half way then use San Diego's winds
2. Use the back side of the flight computer to determine the WCA or wind correction angle and the GS or ground speed.
    a. Follow the directions at the top and if having trouble use the instruction booklet included with the computer
    b. When marking the velocity of the wind up from center, put the center dot on 100 and treat that as zero.
3. Log the WCA and GS for each leg into the corresponding boxes.
    a. The numbers will not change if wind and flight direction doesn't change
4. Using the navlog, add/subtract WCA from TC to get TH or true heading.
5. Subtract the variation to get the MH or magnetic heading.
6. Add/subtract zero deviation and have our CH or course heading which is the heading to fly on the heading indicator.
7. To determine ETE or estimated time enroute for each leg, use the front of the flight computer. The first calculation at the bottom says to set the GS over the triangle (aka 60 index) and read the time below the distance.

8. To determine the fuel burned use the same side of the flight computer, second calculation. Set your GPH or gallons burned per hour (found in the POH) over the triangle and read the fuel burn for each leg over the time for each leg.

You've now completed the NavLog. Although it seems long and possibly tedious you need to complete one of these for each way on each cross-country flight. Luckily, it does get easier with practice.

In addition to the NavLog, a good pilot should have all possibly frequencies including ATIS, ground, tower, etc. at the departure and arrival airport as well as field elevation, pattern altitudes, and runway directions and lengths. This information can be found in an AFD, Pilots Guide, Flight Guide or on www.airnav.com

Good Luck!