

**1stMate - The Pilot**  
**Version 3.0**

**September 14 Release**

**Summary**

This program is the first release of (eventually) a fully featured navigation program for Microsoft Windows 3.x. The first module is the piloting program. The piloting program allows you to compile a track of waypoints, performing the intercalculations on the basis of known information. Solutions are given in response to double-clicking on the cell whose value is being sought. Future enhancements will include porting other algorithms to the Windows environment. Options for which we have developed code include celestial navigation, tides, lights, and Kalman-Filter-based bearings only range-finder algorithms.

The name, 1st Mate, refers to the fact that the person second-in-command of a ship (the First Mate in merchants, the Executive Officer in the Navy and Coast Guard) traditionally has borne the responsibility of being the Ship's Navigator.

The colors on the forms indicate the waters in which the module is most likely to be used, with green for coastal waters and deep blue for open ocean.

The version follows earlier releases for DOS and Hewlett-Packard (HP-41, HP-28, and HP-48SX) handheld calculators. The program was written and compiled under Microsoft Visual Basic for Windows. It was sized for a 1024x768 display, so will be larger than the Program Manager Desktop on a VGA display. Simply resize the forms using standard Windows procedures.

**Installation**

To install 1stMate, first start Windows. Using the Windows File Manager, create a subdirectory to contain the program and its data files. For instance, C:\1STMATE. Then copy 1STMATE.ZIP into this sub-directory. Next, use PKUNZIP, MAGELLAN, or another unzip program to decompress the zip file to your new directory. It will decompress the following files:

1STMATE.EXE	The executable
1STMATE.WRI	This file

The Microsoft Visual Basic Runtime library files:

VBRUN100.DLL

GSWDLL.DLL  
CMDIALOG.VBX  
GRAPH.VBX  
GRID.VBX  
PICCLIP.VBX  
THREED.VBX

and a sample trackfile:

DEALENPT.TRP

Place all the \*.DLL and \*.VBX files in your \WINDOWS\SYSTEM directory. Finally, create an entry in Program Manager, following the instructions in your Windows manual. If you are using Windows 3.1, you can do this by 'dragging' the unzipped 1STMATE.EXE from the File Manager to an appropriate window in the Program Manager. You can then start the program by double-clicking on its icon in Program Manager.

### **Using the First Mate Pilot**

To start the pilot program, start 1STMATE.EXE, then click on the "Piloting" item on the menu bar. Then Click on "Voyage Plan."

You may enter data in whatever order you desire. Make sure you choose the correct time, course, and variation modes. Make sure you press the <Enter> key after entering data in a cell, since this is the key to telling the First Mate what you do know. Double-click on cells for which you do not have information. The First Mate will provide the answers if at all possible.

You can perform "what-if" track analysis by deleting one cell (highlight the cell and press the <Delete> key) and then double-clicking a cell for which you wish an answer. Note that the program does not know that a cell entry is valid until you have pressed the <Enter> key to move the highlight to the next cell.

Save or print your track using the items in the File Menu.

Clicking on other menu items won't do very much, but it won't break anything either. These are placeholders for eventual porting of earlier code to Windows.

### **Details and Limitations**

The Voyage Plan Form provides a spreadsheet form with a number of option buttons for data entry. Data entry is performed on a spreadsheet form using standard Microsoft Windows 3.x procedures. There is no particular order in which data must be entered. The program will use the information you have provided to calculate the remaining fields if this is mathematically possible.

At present, the spherical coordinate option button effects have not been implemented. We use Cartesian coordinates on a Mercator projection.

Input data are corrected to Universal Time and true course for internal storage according to the values entered for time zone, variation, and course mode. Waypoints are then displayed in UT or local time, True or Magnetic course, according to how the time, course, and variation option buttons have been set.

You tell the program the information you have on each waypoint by entering data in the appropriate cell and pressing the <Enter> key. You then **double-click** on a different cell to calculate the data for the row in which the cell lies. Pressing function key F9 or selecting Calculate Now from the Calc menu item has the same effect. Selecting Calculate All will result in some warning messages if the data has not been entered during this session (if all known data have not been confirmed with the <Enter> key).

You can save your data to a comma-delimited text file with a default extension of \*.TRP to indicate a trip. You can print the file to your printer, assuming it has been installed in your Windows Control Panel. Use the choices in the File item on the menu bar.

You can also import the \*.TRP file to Microsoft Excel or any other spreadsheet which recognizes comma delimited files.

Note that the **data file** presents time in the standard Windows Julian date, and all positional, course, and speed data in decimal form. The Voyage Plan and printout display Dates and Time according to the Date/Time format selected in the Windows Control Panel. Positions are presented in the Voyage Plan window and in the printout as Degrees, Minutes, and hundreds of minutes.

The program solves the two basic problems: Time/Speed/Distance and Departure Position/Destination Position/TrackLeg. If you know two of the elements in each of these triads,

the program will provide the third element. Distances and times are then accumulated to give a concise sail plan.

If you have not identified two of the three elements in each triad the program will report "Insufficient information - Review your inputs." If your grid is full then chances are that you clicked out of a cell without hitting the <Enter> key.

There are literally dozens of possible combinations of input data for which solutions will be provided, far too many to enumerate here. The only Cartesian option we have not implemented is Latitude or Longitude Intercept with no course specified. This will require specifying the desired quadrant, and will be provided in the next release.

Note that you cannot use quote marks in your waypoint descriptions. The data files are simple comma-delimited text files; quote marks upset input routines for comma-delimited databases. If you must set words apart use a # or some other symbol. The program will trap quote marks, but if you mess about in your TRP file with a text processor you might get some quote marks in there. Also, if you import it to a spreadsheet and save as a \*CVS file, quote marks will be added. So if you find the program bombing on trying to load a file that's been around a while, take the file into a text editor and kill off the quote marks. Also, kill off any extra spaces, Ctrl-Z, or other trash which may have been added at the end of the file. The program writes a nice clean file that stops at the end of the last waypoint. Additional (even non-printing) characters beyond that point will crash the loading routine. We could prevent this by encoding the data in some proprietary form, but then you wouldn't be able to import text files... So if this is a problem, let us know.

If you have sea time behind you, you should find the program quite intuitive. If not, your \$20.00 US contribution will help develop a more fully tutorial set of documentation. In the meantime, *The American Practical Navigator (Bowditch)*, published by the Defense Mapping Agency Hydrographic/Topographic Center, Publication No. 9, is the bible for navigation and contains all the algorithms implemented by this program. *Reed's Nautical Almanac and Coast Pilot* has much of the required information and algorithms and is a less expensive (albeit less enduring) reference.

The program calculates rhumbline tracks between waypoints given in Cartesian coordinates, assuming a Mercator projection, using standard mathematical procedures documented in numerous publications on piloting and navigation. We assume no liability, direct or consequential as a result of your installing or using this program. The program is provided on an

"as is" basis.

This program is not free. The copyright is retained by the author, Alliance Marine Limited, and the program is distributed as shareware, or user supported software. This means that you may use the software for a reasonable period of time, to determine if it meets your needs. Obviously, you may install it on as many machines as you possess or are the principal user of, so long as you are the "principal user." On the other hand, if you continue to use it, then you should pay for it. This will encourage us to do a better job of what we enjoy and know how to do to give you more time to do the things you enjoy and know how to do.

You are also permitted to copy the distribution zip file, and to distribute it to others on the same conditions, providing you make no charge beyond the cost of the medium, that the software is distributed complete with this notice, and not in conjunction with any other software. In fact, please do so.

Try out the program. If you like it, send \$20 to help us develop it further, with more robust documentation. If you decide to continue using this program, please send \$20.00 US to:

Alliance Marine Limited  
5797 Rayburn Avenue Suite 163  
Alexandria, VA 22311

The \$20.00 buys you nothing but the right to continue using this program, a clear conscience, and the peace of mind that comes from knowing that you have recognized the work done by the author to provide you with something which you find useful.

If you have any comments or suggestions about this program, you may contact us at the above address, on BIX as "alavarre", or on Compuserve ID 76540,40.

We hope you will find this useful. Please let us know your opinions, pro or con.

Fair winds,  
Alliance Marine Limited  
September 5, 1992