HELP Source Code Notes

# Summary

So far, I have been unable to compile the source code. From what I could find in the code and from googling, the source code was previously compiled with a program called **RMFORT**. While researching, I discovered that this software was also used to compile several other old environmental programs, such as SWMM. There’s more information related to these findings in the last section of this document, under the **\*.bat** files section.

By default, NetBeans tries to compile source Fortran code as F90. This is probably configurable, but I haven’t yet tried switching it to compile F77 for our existing source code.

I have tried compiling manually via command line with **gfortran**, but get several compile time errors.

# Common Abbreviations

* FOR – Fortran (pertaining to file extensions)
* BAS – BASIC (pertaining to file extensions)
* PREC – Precipitation
* SRAD – Solar Radiation
* TEMP – Temperature
* CAN – Canadian (pertaining to data file types)
* ASCI – ASCII text (pertaining to data file types)
* CLIM – Climate (pertaining to data file types)

# Fortran Source Code

* **HELP30.FOR** is the starting location for the application. From comments in the file:
  + DIRECTS THE RUNNING OF THE SIMULATION AND PRINTING OF OUTPUT, AND PERFORMS THE ACCOUNTING ON THE RESULTS.
* **ASCIMISC.FOR** appears to be used to print output to file in a grid format. It references cells, rows, cols, etc.
* **ASCIPREC.FOR**
  + THIS ROUTINE CONVERTS AN ASCII FILE TO A FORMATTED FILE CONTAINING DAILY VALUES. EACH LINE OF OUTPUT CONSISTS OF THE YEAR, TEN DATA VALUES, AND THE LINE NUMBER.
  + PROGRAM SCANR
  + Rainfall
* **ASCISRAD.FOR**
  + THIS ROUTINE CONVERTS AN ASCII FILE TO A FORMATTED FILE CONTAINING DAILY VALUES. EACH LINE OF OUTPUT CONSISTS OF THE YEAR, TEN DATA VALUES, AND THE LINE NUMBER.
  + PROGRAM SCANS
  + Solar Radiation
* **ASCITEMP.FOR**
  + THIS ROUTINE CONVERTS AN ASCII FILE TO A FORMATTED FILE CONTAINING DAILY VALUES. EACH LINE OF OUTPUT CONSISTS OF THE YEAR, TEN DATA VALUES, AND THE LINE NUMBER.
  + PROGRAM SCANT
  + Temperature
* **SYNGEN.FOR** – THIS ROUTINE PREPARES CLIMATOLOGICAL INPUT FILES FROM THE SYNTHETIC CLIMATOLOGICAL DATA TAPE.
  + TAPE1 CONTAINS THE SYNTHETIC RAIN PARAMETERS, ALPHA AND BETA.
  + DATA4 CONTAINS THE SELECTED DAILY PRECIPITATION VALUES.
  + DATA7 CONTAINS THE SELECTED AVERAGE DAILY TEMPERATURES.
  + DATA11 CONTAINS THE NAME OF THE SELECTED CITY, THE EVAPORATIVE ZONE DEPTH, THE VEGETATION TYPE, MAX LAI, PLANTING AND HARVESTING DATES.
  + DATA13 CONTAINS THE SELECTED SOLAR RADIATION VALUES.

# BASIC Source Code

* **CANPREC.BAS**
  + Does something with “Canadian Precipitation” files.
* **CANSRAD.BAS**
  + Does something with “Canadian Solar Radiation” files.
* **CANTEMP.BAS** 
  + Does something with “Canadian Temperature” files.
* **CLIMX.BAS** files:
  + These files appear to parse Climate data pertaining to PREC, SRAD, and TEMP.
  + They do a lot of logic with days, months, years.
  + They also appear to bring in data from a file “PASSNAME.DAT”
  + **CLIMPREC.BAS**
  + **CLIMSRAD.BAS**
    - This is the only file of the 3 that defines a city (hardcoded to Phoenix, AZ).
    - It also has references to AZ2 files of type “.PRT” and “.OUT”.
  + **CLIMTEMP.BAS**
* **DESIGNX.BAS**
  + It looks like each subsequent DESIGN file builds upon the previous one, adding some new functionality. Will have to look at where they’re referenced to see how they are all actually used.
  + **DESIGN.BAS**
  + **DESIGN2.BAS**
    - Most noticeable difference is that this file has ERRMSG definitions.
  + **DESIGN3.BAS**
    - Appears to have logic for user interactions in a GUI. Mouse and key interactions.
* **H3LOGO.BAS** – This file just prints out the Introductory Window to console (DOS).
* **H3MENU.BAS** – This file appears to simply print the menu to console (DOS) and handle user input, such as navigating the menu, inputting files, etc.
* **MESSAGES.X**
  + There are several versions of this file in various extensions. All of them are binary, so can’t be viewed in text editors.
* **NOAAX.BAS**
  + **NOAAPREC.BAS**
  + **NOAASRAD.BAS**
  + **NOAATEMP.BAS**
* **OUTPUT.BAS**
* **WEATHERX.BAS**
  + **WEATHER.BAS**
  + **WEATHER2.BAS**
  + **WEATHER3.BAS**
  + **WEATHER4.BAS**

# Other Files

* X.BAT
  + There are three of these Windows Batch files: SPL, SSL, STL.
  + They appear to be the primary drivers for compiling the source code.
  + They use a command called ‘rmfort’ and reference an installation directory ‘c:\RM\LINK’, presumably for the linker.
  + From what I can find on Google, this is a reference to a custom F77 compiler created by Ryan McFarland. However, I can find no concrete details, much less an installation option.
  + I found an EPA report for WASP4 that also uses the RMFORT compiler.  
    [https://books.google.com/books?id=T9e4avYOg0UC&pg=PA246&lpg=PA246&dq=install+%22rmfort%22&source=bl&ots=ewrVZN0eAu&sig=ZcpRL388VA4IE6luPCU3QFBhq4E&hl=en&sa=X&ved=2ahUKEwjVuJ2ln7HeAhVS1lMKHa7EAPUQ6AEwBHoECAQQAQ#v=onepage&q=install%20%22rmfort%22&f=false](https://books.google.com/books?id=T9e4avYOg0UC&pg=PA246&lpg=PA246&dq=install+"rmfort"&source=bl&ots=ewrVZN0eAu&sig=ZcpRL388VA4IE6luPCU3QFBhq4E&hl=en&sa=X&ved=2ahUKEwjVuJ2ln7HeAhVS1lMKHa7EAPUQ6AEwBHoECAQQAQ" \l "v=onepage&q=install "rmfort"&f=false)
  + There are a few projects in github that reference rmfort.
  + Found an installation option:  
    [http://vetusware.com/download/RMFORTRAN%202.40/?id=8080](http://vetusware.com/download/RMFORTRAN 2.40/?id=8080)
  + See if we can get the rmfort installation software from EPA?