Installation instructions

The installation file is delivered by an email that contains a link to a folder on Harry's goggle drive. Opening the link will download a compressed file to your download directory. Extract the installation folder (IF) to a convenient location such as the C-drive on Win XP, through win 10.

The IF, called NAST_CORE, contains the following directories:

Folder	File Name	Description
/bin		
	analysis.exe	The executabe
	gateway.dll	Required dll library
	dformd.dll	Required dll library
	sms.dll	Required dll library
/docs		
	cml.pdf	CMLAB user manual
	Install.pdf	Installation instructions
/testit	beam_sol_1.dat	Test problem
/testit/results		Test problem results
/examples	Several examples	
/examples/CML	AMSS circplate	
/rc		
	nast.rc	Text file. (See cml.pdf for instructions for creating)
	License.txt	License file. (Don't lose it.)
/rf		
	Contains DMAP programs for “Rigid Formats”	

Environment Variables

User Variables (Windows)

The following user defined environment variables must be defined:

Variable Name	Value
CML_INSTALLDIR	C:\NAST_CORE
CML_RCFILE	C:\NAST_CORE/RC/NAST.RC

CML_RFDIR	C:\NAST_CORE/RF

Assuming that the installation directory is “c:\nast_core”, open “Control Panel\All Control Panel Items\System”. In the left hand panel click, “Advanced System Settings” and on the System Properties Panel select “Environment Variables”. On the associated panel select NEW User variable and then enter the names and values for each new user variable.

System Variables

The “path” system environment variable must modified to add <full path name of the installation directory>/bin. Scroll down the list of System Variables and click on “path”; the select **edit**. Then in the Edit environment variable pop-up form select **New** and add C:\NAST_CORE/BIN. If the installation directory is different then use that rather than C:\NAST_CORE.

After making there changes close the Control Panel by clicking OK on each successive display.

Verifying Environment Variables

Open a new terminal window. Enter:

```
echo  %cml_installdir%
echo %cml_rfdir%
echo %cml_rcfile%
echo %path%
```

Verify the values are those expected.

Temp Directory

The program writes files to a directory called temp on the c-drive. If it doesn't exist, create it.

Verify the Installation

From the terminal window enter:

```
analysis c:/nast_core/examples/beam_sol_1.dat
```

assuming that the environment variables are set correctly the program will run to completion and display the following in the terminal window:

```
FORTRAN LOGICAL UNIT MANAGER
    Total Number  :  1024 (    1 to  1024)
    Number Used   :     0
    Number Free   :  1024


    Reserved Pool :   100 (    1 to   100)
```

```
    General  Pool :   412 (  101 to   512)
    GINO     Pool :   512 (  513 to  1024)

    LU  Status       Usage        LogicalName   Pool
 -----  ------------ ------------ ------------  ------------
Current Working Directory is C:\Users\User
Cracking Command Line Arguments:
     Current Working Directory is C:\Users\User
     Setting TMG_PROBNAME to C:\nast_core\examples\beam_sol_1.dat
Found CLI RC file C:/NAST_CORE/RC/NAST.RC
Cracking RC File C:/NAST_CORE/RC/NAST.RC
     Setting TMG_RFDIR to C:\nast_core\rf
     Setting TMG_LICENSE_FILE to C:\nast_core\rc\license.dat
     Adding Cell 103 with value 1 to TMG_SYSTEM
            TMG_SYSTEM=103_1
     Setting TMG_SDIR to C:\temp
     SYMBOL QATEMP is set to \temp
     Setting TMG_DBMEM  to 0
     Setting TMG_OCMEM  to 104857600
Found CLI RC file C:/NAST_CORE/RC/NAST.RC
     Setting OUT FILE to C:\nast_core\examples\beam_sol_1.out
     Setting TMG_LOGNM to C:\nast_core\examples\beam_sol_1.log
     Setting TMG_OPTPNM to C:\nast_core\examples\beam_sol_1.optp
     Setting TMG_NPTPNM to C:\nast_core\examples\beam_sol_1.nptp
     Setting TMG_DICTNM to C:\nast_core\examples\beam_sol_1.dic
     Setting TMG_PUNCHNM to C:\nast_core\examples\beam_sol_1.pch
     Setting TMG_PLTNM to C:\nast_core\examples\beam_sol_1.plt1
     Setting TMG_FTN12 to C:\nast_core\examples\beam_sol_1.op2
     Setting TMG_FTN14 to C:\nast_core\examples\beam_sol_1.op4
     Setting TMG_SOF1 to C:\nast_core\examples\beam_sol_1.sof1
     Setting TMG_SOF2 to C:\nast_core\examples\beam_sol_1.sof2
     Setting TMG_SOF3 to C:\nast_core\examples\beam_sol_1.sof3
     Setting TMG_SOF4 to C:\nast_core\examples\beam_sol_1.sof4
     Setting TMG_SOF5 to C:\nast_core\examples\beam_sol_1.sof5
     Setting TMG_SOF6 to C:\nast_core\examples\beam_sol_1.sof6
     Setting TMG_SOF7 to C:\nast_core\examples\beam_sol_1.sof7
     Setting TMG_SOF8 to C:\nast_core\examples\beam_sol_1.sof8
     Setting TMG_SOF9 to C:\nast_core\examples\beam_sol_1.sof9
     Setting TMG_SOF10 to C:\nast_core\examples\beam_sol_1.sof10
```

```
     Setting TMG_INP1 to C:\nast_core\examples\beam_sol_1.inp1
     Setting TMG_INP2 to C:\nast_core\examples\beam_sol_1.inp2
     Setting TMG_INP3 to C:\nast_core\examples\beam_sol_1.inp3
     Setting TMG_INP4 to C:\nast_core\examples\beam_sol_1.inp4
     Setting TMG_INP5 to C:\nast_core\examples\beam_sol_1.inp5
     Setting TMG_INPT to C:\nast_core\examples\beam_sol_1.inpt
     Setting TMG_RTMF to C:\nast_core\examples\beam_sol_1.rtm
NASTRAN-CORE Stage0 Complete============
NASTRAN-CORE Process ID: 9660
USER-MODIFIABLE SYSTEM CELLS USED IN THIS JOB:
SYSTEM CELL 103 (WRT2SCRN) HAS BEEN ASSIGNED THE VALUE          0

0*** USER INFORMATION MESSAGE
THE DEFAULT VALUE OF BUFFSIZE:      8192 WILL BE USED FOR THIS RUN
GINO Buffer Pool Manager BUFFPOOL is    50 buffers
Final memory sizes prior to allocation:
      dbmem    =                     0 words
      ocmem    =             104447900 words
      hicore   =             104447900 words
      buffpool =                409700 words
      Total    =             104857600 words
 QUAD Word Alignment            268517408
***USER INFORMATION MESSAGE
           104447900 words allocated for open core
 WAddress Divisible by 04            67129352
NASTRAN-CORE OK to run ============
OUTPUTBH ASSIGNED to C:/NAST_CORE/BIN/BEAM_SOL_1.KLL
OUTPUTBH ASSIGNED to C:/NAST_CORE/BIN/BEAM_SOL_1.PL
```

This tells us that:

1. The current working directory is C:\users\user
2. The program name is: c:\nast_core\examples\beam_sol_1.dat
3. The RC file has been found and interpreted.
4. The temp file is c:\temp. Might fail if c:\temp is not created
5. Sets memory size
6. Sets the path to several files
7. Defines the buffer size
8. Defines memory allocation
9. Signals that run will proceed
10. Echo two assign statements that are defined in the input file, beam_sol_1.dat, and specifies where the associated files are saved.

Test File

The test file, beam_sol_1.dat, performs a static analysis of a cantilever beam whose properties can be identified from the bulk data section. Of particular interest is the fact that the matrices, Kll amd Pl are saved as sparse matrices in Harwell-Boeing format. The assign statements from the input:

```
ASSIGN OUTPUTBH='C:/NAST_CORE/BIN/BEAM_SOL_1.KLL',UNIT=41 ,
 form=formatted
ASSIGN OUTPUTBH='C:/NAST_CORE/BIN/BEAM_SOL_1.PL',UNIT=42 ,
 form=formatted
```

That are placed after the ID statement. The ALTER

```
ALTER 210
OUTPUTBH KLL,PL,,, // C,N,41/C,N,42 $
ENDALTER
```

then writes these data sets as formatted files to fortran units 41 and 42, respectively, to the files defined by the ASSIGN statements.

Results

The results are saved in the examples directory. The .out and .log files contain the output and log file. It should be noted that the input contained diag 8,14 that requested that the DMAP be echoed in the out file and that trailers be printed on the log file.

The Harwell-Boeing files are written to c:\nast_core\bin as requested. You can open them using a text editor. (These files can be used a DMAP program to solve for displacements, or in any program, perhaps Python, that includes the capability to solve matrix equations whose matrices are defined in Harwell-Boeing format.)