

CRAY/64 Bits

32 versus 64 bit Computers

On all computers TART2002 uses 64 bit precision for REAL variables. 64 bit precision means DOUBLE PRECISION on 32 bit UNIX workstations, and SINGLE PRECISION on 64 bit CRAY computers. The only difference between the UNIX and CRAY versions of TART2002 is that the UNIX version uses DOUBLE PRECISION functions, e.g., DEXP, DCOS, DABS, etc., and the 64 bit CRAY version uses SINGLE PRECISION functions, e.g., EXP, COS, ABS, etc.

WARNING - because of this difference the UNIX and CRAY versions are not interchangeable between computers. On UNIX computers, ONLY use the UNIX version, and on 64 bit CRAY computers, ONLY use the CRAY version.

CRAY UNICOS

The CRAY version of TART2002 is configured to compile and run under CRAY UNICOS. If you are using a different CRAY system, see the section on OTHER computers.

Installation of System Sources

- 1) Make sure you do not have a directory named TART2002, otherwise installation will overwrite it.
- 2) Copy **TARTZ.Z** and **INSTALL.BAT** from the TART2002 CD CRAY directory to your CRAY computer in your base directory [WARNING - do not put them in any other directory]. Make sure the names are EXACTLY as shown here [all upper case characters]
- 3) Make sure **INSTALL.BAT** is executable, i.e., type, `chmod 777 INSTALL.BAT`
- 4) Execute **INSTALL.BAT**.
- 5) Once installation is finished you can delete **INSTALL.BAT** and **TARTZ.Z**.
- 6) Copy the **DOCUMENT** directory from the TART2002 CD to the **TART2002** directory on your computer.

Installed Directory Structure

You should now have a main directory named **TART2002**, and within this directory you should have the following sub-directories,

Documentation

DOCUMENT - On-line documentation in Microsoft Word format

Production Codes

TART2002 - TART2002 source code
UTILITY - A variety of useful utility codes
TARTDATA - Codes and data to create TART2002 data files
EXAMPLES - Example TART2002 input parameters
CRITS - Example critical assembly TART2002 input parameters

You will also have two files,
INSTALL.CRAY - Will compile and install all codes
CLEANUP.BAT - when you are finished, this will delete all files you no longer need.

Graphics Codes

These are not provided for 64 bit CRAY. To use them you will have to use a UNIX workstation, IBM-PC or POWERMAC.

Implementation

Here's a brief outline of what you have to do to implement the system,

- 1) Create the binary, random access files used by TART2002
- 2) Compile TART2002
- 3) Compile the utility codes

INSTALL.BAT is designed to do all of these steps for you automatically. As a backup the appendix includes details of how to manually implement the system. To automatically implement the system,

- 1) Copy **INSTALL.CRAY** from your **TART2002** directory to your base directory, cp TART2002/INSTALL.CRAY .
- 2) Make sure it is executable, i.e., type, chmod 777 INSTALL.CRAY
- 3) Execute **INSTALL.BAT**

It can take some time to complete all of these steps (hours), so be patient until it finishes.

Compilation Errors and Warning Messages

While compiling ALL of the codes you should not receive ANY compiler Error messages. While compiling TART2002 you should receive a few Warnings that certain parts of the code cannot be reached - this is o.k. - these are parts of the code that are currently inactive. On some computers you will get MANY Warning messages that some variables are not being used - this is o.k. - your compiler is merely listing all of the variables from the INCLUDE files that may not be used by individual routines.

If you receive any other Error or Warning messages please report them to me in detail.

Verification

It is highly recommended that you not be in too much of a rush to start using the system, and instead spend the time to FIRST verify that TART2002 is producing reliable results.

The example problem is in the TART2002/TART2002 directory ready to be used with TART2002. It is HIGHLY RECOMMENDED that you take the time to first run this problem. To start the problem type,

```
tart02-4.
```

The execution time will be somewhere between 160 and 18,000 seconds, (about 3 minutes to 5 hours), depending on the speed of your computer. When the problem ends, copy the utility code, critedit, from the utility directory to the current directory and execute critedit by typing,

```
critedit
```

This will give you a summary of the results of the problems run. The important things to check are at the bottom of the output listing, on your screen, and in the file CRITEDIT.LST.

First check the running time, which will give you a good indication of the relative power of your computer - see TART2002.DOC for a list of expected times on a wide variety of computers.

Next check the calculated Average K-eff - this should be about 0.999... to 1.001...

Cleaning Up

Once you have verified that everything is installed and working properly you can delete all of the system source files,

- 1) Copy **CLEANUP.BAT** from your **TART2002** directory to your base directory,

```
cp TART2002/CLEANUP.BAT .
```
- 2) Make sure it is executable, ,i.e., type,

```
chmod 777 CLEANUP.BAT
```
- 3) Execute **CLEANUP.BAT**

Appendix

The following is provided as a backup, in case **INSTALL.CRAY** has any problems in compiling and installing the codes. If here is a problem you can still follow the below steps.

Production Codes

1) In TARTDATA edit INSTALL.BAT to use your compiler, then make sure the file INSTALL.BAT is executable, e.g.,

```
chmod 777 INSTALL.BAT
```

Then execute it by typing,

```
INSTALL.BAT
```

This will compile four codes and then run each code to create the four binary, random access files used by TART2002.

On most computers there is nothing to do until this batch file finishes running. However, on some computers you will be asked to approve deletion of certain files - answer yes (y) each time.

When this batch file has finished running you will find the four random access, binary files,

```
TARTND      - Neutron interaction data
TARTPPD     - Neutron induced photon production data
GAMDAT      - Photon interaction data
NEWCROSS    - Neutron multi-band, self-shielding data
```

Move these four files to the directory where you will execute TART2002
~/TART2002/TART2002.

Once you have created the binary, random access data files and moved them to where you will be using them you no longer need the TARTDATA directory and you can delete it.

2) In TART2002/SOURCES, you next have to compile TART2002. TART2002 is a single file that you should compile and load. The only special library used by TART2002 is lmath. Compile using your compiler and name the executable tart02-4.

Next copy tart02-4 sub-directory where you will be executing the code (~/TART2002/TART2002).

Once you have done this you no longer need the source code, in this directory and you

can delete the entire TART2002/SOURCES directory.

When you have completed this step you will be able to run TART2002. In the directory /TART2002/TART2002 to run the example problem type,

tart02-4

3) In UTILITY, edit INSTALL.BAT to use your compiler, make sure the file INSTALL.BAT is executable, e.g.,

```
chmod 777 INSTALL.BAT
```

Then execute it by typing,

```
INSTALL.BAT
```

This will compile all of the utility codes for your later use. Once you have done this you no longer need the source code, in this directory and you can delete all *.f and INSTALL.BAT.