

## Build issues for Screamer V4.4.1 on Mac OS X Mojave

If you plan to compile Screamer on your Mac then you MUST: have either Mojave or Catalina installed on your Mac; have the latest version of xCode and the xCode command line tools installed on your MAC; and finally have a version of gcc/gfortran installed.

—> The latest version of Xcode is Xcode V11.2.1 (as of 2019-12-06) . Check with the macOS App Store. The Command Line Tools can be installed several ways. you can get the command-line tools by simply typing `xcode-select --install`. And on Catalina, you may have to specify an additional include path `-I/Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/usr/include` for the compiler to find the system headers. You may visit <https://developer.apple.com/downloads/> and download the latest tools and/or xCode files.

—> The latest Screamer approved version of gcc is gfortran (8.3) and gcc (8.3) . These versions of the compilers are actually approved only for Mojave and Catalina. If needed, go to <http://hpc.sourceforge.net/index.php> and download the binaries for gcc and gFortran. Follow the installation instructions.

NOTE: Modern CPUs are all 64 bit and the compilers assume 64-bit.

After HPC binaries and xcode command-line tools are installed, this is what you see.

As of 2019-12-06 for macOS - Mojave 10.14.5

An example is shown operating from my terminal window (The type bold lines below are the input.)

for gcc gfortran version type

```
RBS-MacBook-Pro:~ rbspielman$ gfortran -v
```

```
Using built-in specs.
```

```
COLLECT_GCC=gfortran
```

```
COLLECT_LTO_WRAPPER=/usr/local/libexec/gcc/x86_64-apple-darwin18.5.0/8.3.0/lto-wrapper
```

Target: x86\_64-apple-darwin18.5.0  
Configured with: ../gcc-8.3.0/configure --enable-checking=release  
--enable-languages=c,c++,fortran  
Thread model: posix  
gcc version 8.3.0 (GCC)

for the hpc version of gcc

```
RBS-MacBook-Pro:~ rbspelman$ gcc -v
Using built-in specs.
COLLECT_GCC=gcc
COLLECT_LTO_WRAPPER=/usr/local/libexec/gcc/x86_64-apple-darwin18.5.0/8.3.0
/lto-wrapper
Target: x86_64-apple-darwin18.5.0
Configured with: ../gcc-8.3.0/configure --enable-checking=release
--enable-languages=c,c++,fortran
Thread model: posix
gcc version 8.3.0 (GCC)
```

for Apple Clang

```
RBS-MacBook-Pro:~ rbspelman$ clang -v
Apple clang version 11.0.0 (clang-1100.0.33.16)
Target: x86_64-apple-darwin18.7.0
Thread model: posix
InstalledDir:
/Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/bin
```

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Build #1 Dynamic gFortran compile

```
gfortran zdem.for *.f -O03 -mcmmodel=medium -o screamer64dyn
```

```
Ricks-MacBook-Pro:src rbspelman$ otool -L screamer64
```

```
screamer64:
```

```
    /usr/local/lib/libgfortran.4.dylib (compatibility version 5.0.0, current version 5.0.0)
```

```
    /usr/lib/libSystem.B.dylib (compatibility version 1.0.0, current version
```

1252.200.5)

    /usr/local/lib/libgcc\_s.1.dylib (compatibility version 1.0.0, current version 1.0.0)

    /usr/local/lib/libquadmath.0.dylib (compatibility version 1.0.0, current version 1.0.0)

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### Build #2 Partial Static Fortran Compile

```
gfortran zdem.for *.f -O03 -mcmmodel=medium -static-libgfortran -static-libgcc -o screamer64s
```

screamer64s:

    /usr/local/lib/libquadmath.0.dylib (compatibility version 1.0.0, current version 1.0.0)

    /usr/lib/libSystem.B.dylib (compatibility version 1.0.0, current version 1252.200.5)

Note: Not full static! libquadmath is still dynamic.

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### Build #3 Fully Static Compile (Use gcc linker)

```
gfortran -c -O03 -mcmmodel=medium zdem.for *.f
```

```
ar crv screamer64.a *.o
```

```
rm *.o
```

```
ranlib screamer64.a
```

```
g++ -o screamer64 screamer64.a -static-libgcc /usr/local/lib/libgfortran.a
```

```
/usr/local/lib/libquadmath.a
```

```
cp screamer64 ../run_decks/screamer64
```

```
rm screamer64.a
```

In this case, we needed to overcome **4**, gcc compiler bugs. 1) neither `-static-libquadmath` nor `-llibquadmath` works when called in the `gfortran` command, 2) full path to `libquadmath.a` - `/usr/local/lib/libquadmath.a` does not work when used in the `gfortran` command, 3) `-static-gfortran` or `-lgfortran` does not work in the `gcc/g++` command line - use full path - `/usr/local/lib/libgfortran.a`, and 4) neither `-static-libquadmath` nor `-llibquadmath` work in the `gcc` command line - path does work here - `/usr/local/lib/libquadmath.a`.

```
RBS-MacBook-Pro:src rbspielman$ otool -L screamer64  
screamer64:
```

```
    /usr/lib/libSystem.B.dylib (compatibility version 1.0.0, current version  
1252.250.1)
```

otools shows a fully dynamic build with only the default Apple libSystem used.