scat.f is a two-body scattering solver in a general Woods
saxon potential (real, imaginary, spin-orbit) for a given
l, s, j quantum number set - but over a range of energies.
Input can be provided at the program prompts else put
in a file and read using the standard redirect scat<filename

Output is of the phase shifts to a file phases.xxx where xxx
is read from the input.
energy   phase shift (degrees)   wavenumber

For low energy deuteron scattering from an alpha particle
in 1+ state with ell=2:

```
xxx
4.0   2.0
2.0   1.0
80.0 1.2000  0.70
0.   1.      1.
0.   1.      1.
2.00 1.2000  0.70
2    7   .01
1    1

%-----------------------------------------------------
phase-shift output file
mass   core   valence
charge core   valence
real potential  vr  rr   ar
imag potential  wv  rv   av (volume)
imag potential  ws  rs   as (surface)
s-o  potential  vso rso  aso
lval    emax    energy_step
s-value  j-value
%-----------------------------------------------------
```