Use of artificial neutron sources made it convenient to have charts relating neutron energy, laboratory or center of gravity angle, and bombarding energy. Such charts will be displayed for $\text{Li}^7(p,n)$, $D(D,n)$, and $\text{Cl}^2_2(D,n)$.

In the general reaction with energy $Q$ mass $M_1$ with kinetic energy $E_1$ strikes $M_2$ at rest producing $M_3$ at laboratory angle $\theta$ with kinetic energy $E_3 = C^2$. The vectoral velocity of $M_1$ in the laboratory system $(C\sqrt{2}/M)$ is equal to the vectoral velocity of $M$ in the c.g. system $(B\sqrt{2}/M)$ plus the vectoral velocity of the c.g. system $(A\sqrt{2}/M)$. As $B/A$ and $B$ depend only upon $M_1, M_2, M_3, M_4, E_1, and Q$ and not upon the angles, a series of semicircles are drawn with radii $B$ and whose centers are displaced from the origin by distance $A$. About the origin a series of semicircles of radii $C$ are drawn and through the origin a set of radial lines are drawn to demark angles. The two sets of semicircles are labeled with the appropriate energies. A triple intersection designates a set of values.

$$A = \sqrt{\frac{M_1 M_3}{(M_1 + M_2)^2}} \sqrt{E_1}$$

$$B = \sqrt{\frac{M_2 M_4}{(M_1 + M_2)^2}} \sqrt{\frac{E_1 + \frac{M_1 + M_2}{M_2}}{Q}}$$

Center of gravity angles can be designated on the chart. Solid angle transformations are simply related to the energies.
Neutron energy in keV (dotted circles)

Neutron energy in keV (solid circles)

C\textsuperscript{18}(d, n)

C\textsuperscript{18} + D \rightarrow N + n - 260 \text{ keV}
$T + p \rightarrow n + \text{He}^3$ at 735 KeV

The radial broken lines starting at $E_p$ indicate the center of gravity angles $\beta$.

Read $E_p$ as the intersection of the solid circle of radius $C$ at angle $\beta$ with the dotted circle of radius $B$ determined by $E_p$. Interpolate as necessary.