The rotational spectra for hydrazoic acid (HN$_3$), its isotopologues, and its vibrational satellites have been reexamined using millimeter-wave rotational spectroscopy in the range of 240-360 GHz. Treating sodium azide (NaN$_3$) or the commercially available singly $^{15}$N-labeled NaN$_3$ with phosphoric acid or deuterated phosphoric acid yielded 6 different isotopologues. From these samples, we were also able to observe all of the isotopologues containing one additional $^{15}$N at natural abundance. In total, we assigned rotational transitions to 14 different species; only H$^{15}$N$_3$ and D$^{15}$N$_3$ were not accessible. With the large number of rotational constants determined for these isotopologues, an excellent equilibrium structure determination was performed with CFOUR’s xrefit routine. This structure shows a bent azide sub-unit, and is in excellent agreement with the geometry optimization performed at the CCSD(T)/ANO2 level of theory. The Coriolis perturbation of the ground and first two vibrationally excited states of HN$_3$ will also be discussed.