Mössbauer Study of Eu$_{14}$MnSb$_{11}$ and Yb$_{14}$MnSb$_{11}$ Zintl Compounds. DURGA KAFLE, Department of Physics, USU, Logan, UT 84322, DENNIS BROWN, Department of Physics, NIU, Dekalb IL 60115 — Antimony-121 Mössbauer effect measurements have been performed mainly on Eu$_{14}$MnSb$_{11}$ and Yb$_{14}$MnSb$_{11}$ zintl compounds, through the temperature range from 2 K to room temperature. The isomer shifts observed (-4.5 mm/sec to -10.3 mm/sec and -7.7 mm/sec to -11.2 mm/sec, respectively) from the present study for both Eu$_{14}$MnSb$_{11}$ and Yb$_{14}$MnSb$_{11}$ zintl compounds are close to the values (-8.5 mm/sec to -8.73 mm/sec) obtained for InSb, the standard compound for antimony-121 Mössbauer effect measurements. Isomer shift distribution fits by using a Voigt-based Gaussian distribution profile show distinct peaks at the corresponding average isomer shift values obtained from Lorentzian four-site fits for Eu$_{14}$MnSb$_{11}$. The study of the temperature dependence of line broadening as well as hyperfine magnetic field confirms the existence of long-range magnetic ordering of antimony-121 in Eu$_{14}$MnSb$_{11}$ below 12 K which resulted in the transition temperature, T$_{C}$, of 12 K, whereas T$_{C}$ found in Yb$_{14}$MnSb$_{11}$ is 45 K. The linear fit of the natural logarithm of area versus temperature using the Debye model for the high-temperature limit gives the values of 185 K and 196 K for the Debye temperature for Eu$_{14}$MnSb$_{11}$ and Yb$_{14}$MnSb$_{11}$ zintl compounds, respectively.