The CRYRING Superconducting Electron Cooler, H. DANARED, A. KÄLLBERG, L. LILJEBY, K.-G. RENSFELT, MSI, Stockholm - Continuing the development of electron beam expansion in order to further reduce the transverse electron temperature, the electron cooler at CRYRING has since the summer of 1997 been equipped with a superconducting gun solenoid. Its maximum field is 5 T and it has a warm bore of 123 mm diameter and 640 mm length. It houses an electron gun with a 4-mm-diameter cathode and two anodes, the second one having a length of 300 mm. An expansion factor of 100 is achieved by running the gun solenoid at, typically, 3 T and then using 300 G in the rest of the cooler. This results in an electron beam with 40 mm diameter in the cooling solenoid and with a transverse energy spread in the order of 1 meV (an exact value has not been measured at the time of abstract submission). The longitudinal energy spread at 25 mA and 2 keV has been measured to approximately 0.05 meV. The very low electron temperature has resulted in further substantial improvements of the energy resolution in recombination experiments, whereas only a small improvement of the cooling force has been observed.