E. MAGNETICS

The magnetic field of an RTG exerts two effects on spacecraft performance: (1) the field may interfere with experiment sensors such as magnetometers and (2) interaction of the RTG field with other magnetic fields in space may yield a torque which must be compensated to preserve spacecraft orientation. Since the field strength and magnetic moment constraints are in general, very restrictive, measurements of these levels in the presence of extraneous fields (such as exist on earth) are subject to uncertainty, thus experimental determination of the RTG characteristic is very difficult. Nevertheless, facilities such as the Goddard Magnetic Test Facility and Jet Propulsion Laboratory have attempted such measurements.

In addition to experimental data, theoretical depictions of the SNAP 19 generator configuration are presented to yield basic characteristics such as attenuation dependance upon distance and magnetic moment. Before presenting the results of these calculations and comparison with experiment, a brief discussion of units, equivalent circuits, and general generator configuration is given.

1. Units

The basic electromagnetic units in this discussion are for the cgs system, where the permeability (μ_v) of free space (vacuum) is taken as unity and electrical quantities are labeled abamperes and abvolts. The unit of magnetic induction or flux density (B) is the gauss, and its surface integral (flux) is the maxwell. One other quantity is necessary, the magnetic intensity or field strength (H) labeled the oersted. This