Minimizing Stray Magnetic Fields through Materials Selection

Using magnetic materials, components, and wiring layout that can generate magnetic fields must be minimized in constructing space flight hardware. Proper design and choice of manufacturing techniques can greatly reduce or eliminate stray magnetic fields.

General

- Keep electronic component lead lengths as short as possible.
- Avoid wiring loops and multiple ground paths.
- Use shielded wire or twisted pairs.

To reduce magnetic fields, avoid using ferro-magnetic materials for parts and structure whenever possible. The following is a categorized list of some commonly used structural and electronic materials:

NON-MAGNETIC		
Aluminum	Germanium	Nickel Silver
Alloy 30, 60, 90	Gold	Phosphor bronze
Alloy 180	Lead	Protoloy
Beryllium	Magnesium alloys	Silver
Beryllium copper	Manganin	Tantalum
Brass	Moleculoy	Titanium
Copper	Molybdenum	Tungsten
Carboloy	Neutroloy	Zirconium

FEEBLY MAGNETIC	
Stainless steel 202 and 300 series	K-Monel Alloy 720

MAGNETIC		
Cobalt	Invar	Pelcaloy
Copperweld	Kovar	Permalloy
Dumet	Mesoloy	R Monel
Electroloy	Molypermalloy	Remendur (Fe-Co-V)
Elinvar	Mu metal	Rodar (=kovar)
Fenicoloy	Nichrome	Silicone steel
Ferrites	Nickel 200, 270	400 Series Stainless
Gridaloy M,P	Nickel Iron	Supermalloy
Iron	Platinum+traces of Fe	Vicalloy