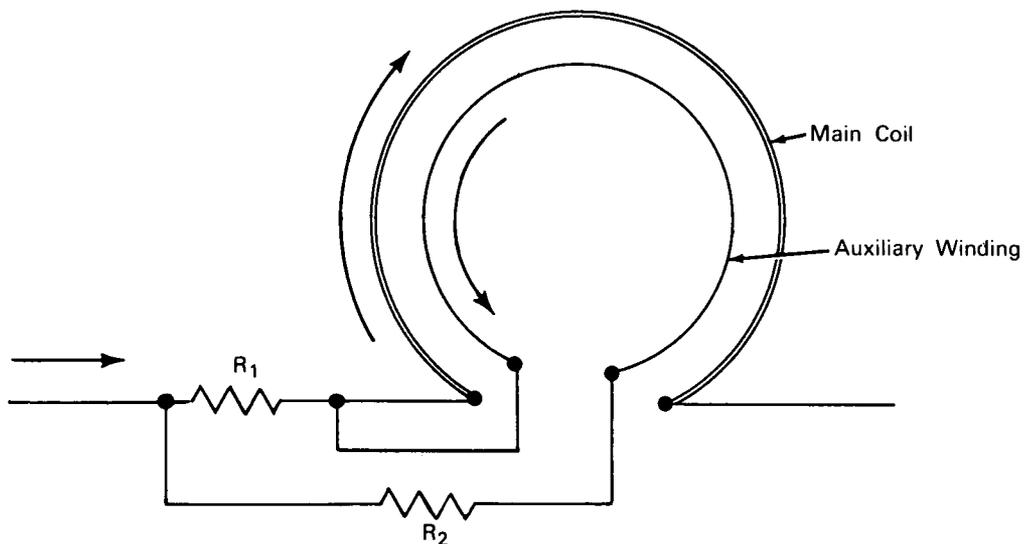


NASA TECH BRIEF



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Magnetic Field Test Coils Are Temperature Compensated



The problem: Magnetic field test coils, even though precisely calibrated, exhibit changes in field configuration due to thermal expansion or contraction that cause dimensional changes in the coil producing the magnetic field.

The solution: An auxiliary winding that is wound opposite to the main coil winding and makes thermal contact with the main coil. This auxiliary coil is fed from a constant voltage source and provides a small magnetic field that cancels out a small fraction of the main winding field.

How it's done: A single turn auxiliary winding of # 12 aluminum wire is wound on the main coil so that its field opposes the field of the main coil. Current flow in the auxiliary winding is in the opposite direction to that in the main winding and its field cancels a

small fraction of the main winding field. As the coil assembly temperature rises, the resistance of the auxiliary winding will increase and current flow in the winding will decrease. The field produced by the auxiliary winding will correspondingly decrease. An identical activity will be simultaneously taking place in the main coil and its field. By the proper choice of the ratio of R_1 to the single turn coil resistance R_2 , it is possible to make the decrease in the opposing field exactly cancel the decrease in the main field caused by thermal expansion in the main coil.

Notes:

1. This invention should find application wherever measurement of electrical and magnetic parameters are being investigated with precisely calibrated magnetic field test coils.

(continued overleaf)

2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Goddard Space Flight Center
Greenbelt, Maryland, 20771
Reference: B65-10081

Patent status: NASA encourages the immediate commercial use of this invention. Inquiries about obtaining rights for its commercial use may be made to NASA, Code AGP, Washington, D.C., 20546.

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