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Formulas Establish Audio Range Inductance in Beryllium Coils

The net audio-range inductance has been established for two beryllium coils, one called a hammer coil, which is used in metal forming, and the other, a nylon-potted coil, used for cryogenic sealing. Mathematical modeling has been used in separate and unrelated treatment of each coil as to the effects of resistance and capacitance upon the audio-inductance range of each coil.

The same investigative method was used on both coils with the exception of the determination of the electrical fields. Due to the different shapes of the two coils, a different method of electrical field determination was required for each. For the hammer coil, an electrolytic tank was used to obtain an electrical field map. Because of the simpler cross section of the cryogenic sealing coil, the electrical field map was obtained by a geometrical projection. In both cases, the effects of resistance, capacitance, and inductance on the coil net audio inductance were taken into account in the final equations.

Notes:

1. Results of this investigation bring out the fact that in neither of the coils in question is capacitance a factor in the equivalent circuits. Both coils may be said to have only inductance and resistance at audio frequencies.

2. The following documentation may be obtained from:

Clearinghouse for Federal Scientific
and Technical Information
Springfield, Virginia 22151
Single document price \$3.00
(or microfiche \$0.65)

Reference:

NASA-CR-77415 (N66-34792), Development of a Valid Mathematical Formula or Group of Formulas to Establish Within an Accuracy of 5% The Inductance Audio Range Resulting in Beryllium Coil Assemblies

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