THE IMPEDANCE CONTROVERSY

It has been claimed that no balanced circuit impedance can be reliably determined by any method which connects the circuit to a test load and results in an unbalanced circuit. The claim asserts that this is because a balanced circuit is no longer being measured. There several reasons to reject this claim:

1. It violates Thevenin's Theorem which, as stated by the Institute of Electrical and Electronics Engineers in *The New IEEE Standard Dictionary of Electrical and Electronics Terms* says, "Thevenin's Theorem. States that the current that will flow through an impedance Z', when connected to any two terminals of a linear network between which there previously existed a voltage E and an impedance Z, is equal to the voltage E divided by the sum of Z and Z'." There is no special dispensation for balanced circuits to escape the consequences of this theorem.

2. Bench measurements (of the outputs' portions of supply noise voltages), and derivations and simulations of Cathodynes demonstrate that they are not balanced circuits, and so would not be subject to the claim.

3. There are no electrical theorems from which this claim can be argued.

Note also that if the reasoning in the claim is valid, then it could also be argued that the output impedance of a single ended amplifier could not be measured by connecting the amplifier output to a load which reduces the gain to less than unity. This would be because an attenuator rather than an amplifier would be being measured.

And finally, if Thevenin cannot be employed, and unless some presently unknown measurement method is unearthed and justified, then the consequence of the claim is that it is impossible to measure certain impedances!

In conclusion, Thevenin justifies the measurement of a Cathodyne's ground-referenced anode and cathode impedances in the usual manner: by a method involving the connection of a single load between ground and the appropriate one of those two terminals.