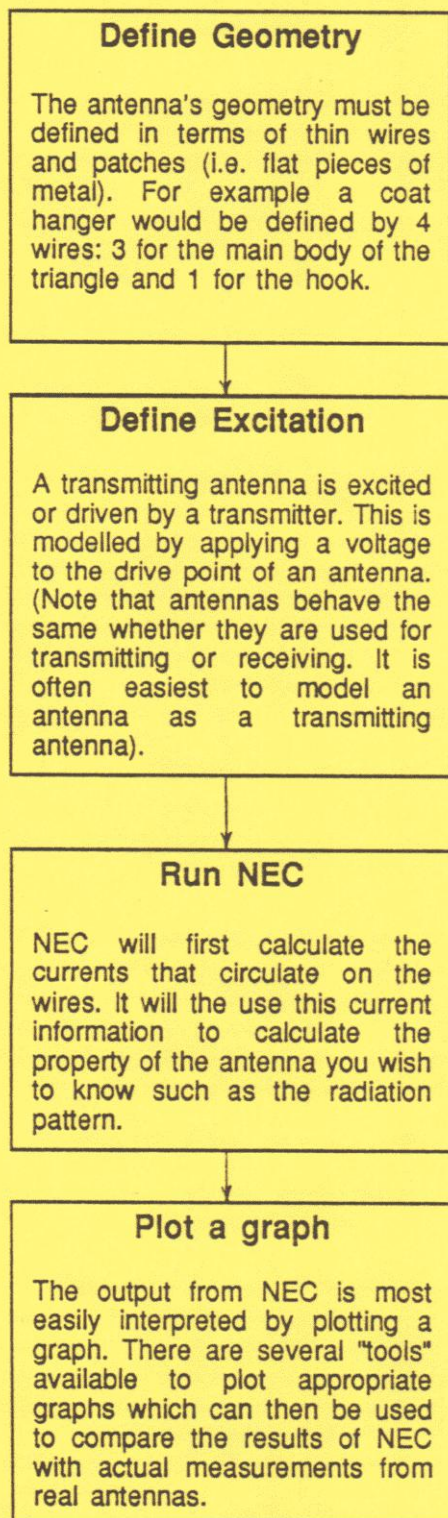


## ANTENNA MODELLING USING NEC



### General

NEC stands for Numerical Electromagnetics Code. It is a piece of software written in America which allows us to calculate the properties of an arbitrary antenna by defining the antenna's geometry and how it is driven (i.e. where you connect the transmitter). Generally antennas are designed to work across a specific range of frequencies and the antenna's characteristics are specified by the performance at the centre frequency and the performance across the working bandwidth. The example calculations shown in the display are all carried out at the centre frequency.

### Why use NEC ?

When building antennas, there can be a lot of problems getting the input impedance correct and obtaining the desired radiation pattern. The usual techniques used are to change the antenna's geometry and to add capacitive and inductive elements. To make a modification to an antenna can often require major re-building and re-testing which may require extra effort. However, if the antenna is being numerically modelled using NEC, a modification involves changing only the input data to the computer program and running the model again. Providing the computer is fast enough, this can save a lot of effort.

### How to use NEC

The flow diagram on the left describes in simple terms how an antenna may be modelled using NEC. It should be noted that the more wires and patches there are in a model, the longer the program will take to run.

### Where to use NEC

NEC was originally written in FORTRAN to run on a VAX computer running the VMS operating system. Recently the code has been made available for IBM PC compatible machines, and a version of the code has been modified at BBC Research Department to run on a high speed Solbourne computer across an Ethernet network. This enables the graphical utilities of the IBM PC environment to be used with the "number crunching" power of the Solbourne.