

Spectrum analyser input attenuator

Written by Hans Summers

Wednesday, 16 September 2009 22:23 - Last Updated Tuesday, 19 April 2016 06:54

{gallery}saattenuator/circuit{/gallery}

The theoretical resistor values required to get the desired attenuation with 50-ohm input/output impedances are not obtainable. To solve this problem, practical-value resistors are paralleled to get the required theoretical values. The necessary parallel resistances were calculated using a spreadsheet. They are indicated on the diagram as a single resistor with multiple value labels. For example in the 4dB section the vertical resistor is made from a 120-ohm, 1K and 4.7K resistor in parallel. The calculated values are such that very precise dB attenuations are obtained.

The DPDT switches have 2 fixing nuts. They are bolted into the screened box (constructed from PCB stock as usual) using one of the nuts, and the whole assembly fixed into the front panel with the other nut. The BNC RF-input socket bolts through the front panel, a washer taking up the nut-thickness between the front panel and the input module box. (In fact, the washer is no more than another piece of inch-square PCB stock with a hole drilled to take the BNC socket thread). In this way, coaxial integrity of the signal path in the analyser is preserved right the way from the input socket to the output.