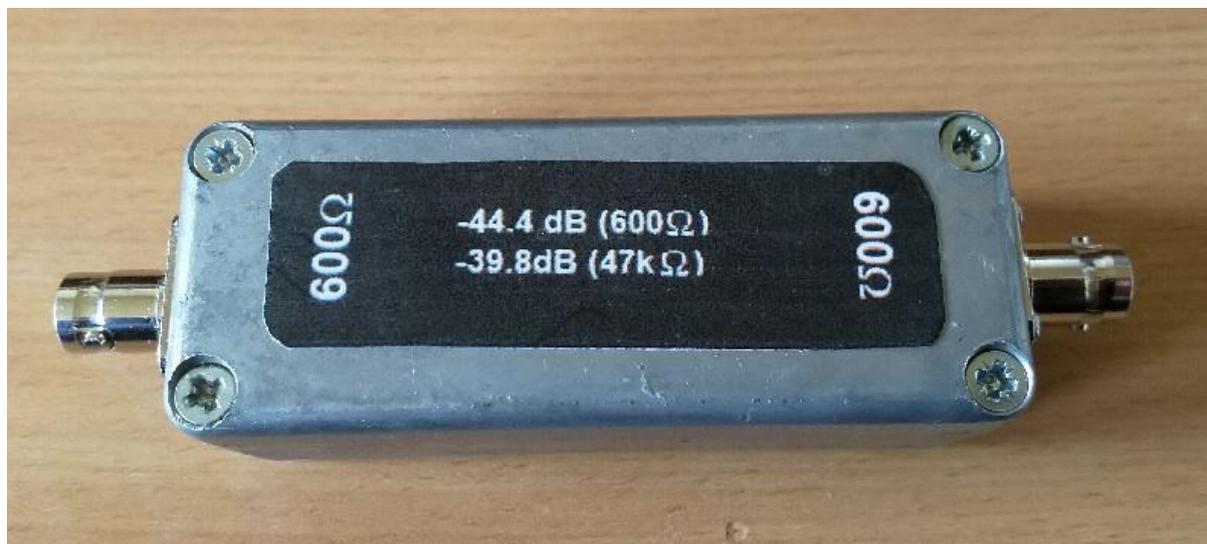


## Quick 40dB Pad for audio testing RIAA Amplifiers.

Les Carpenter G4CNH – April 2022



This is a description of the construction and testing of a 40dB attenuator, specifically made to reduce the output of an AF Signal generator where accuracy of attenuation is not important. It is approximately -44dB into 600 Ohms and just under -40dB into 47k Ohms, quick to manufacture and more robust than many cheaper attenuators.

### The parts needed

Die cast Box, Deltron 462-0010A, Grey Die Cast 89 x 35 x 30mm. RS Stock No. 719-1459, £18.11p  
Deltron make a nice Blue painted version if you can find it.

2 off - BNC Sockets, Straight Flange Bulkhead Fitting, Cricklewood BCD, £1.50p each  
Also needed are 8 off 3mmx10 fixing screws, nuts and 2 off M3 solder tags.  
BUT! The Author found 2mm hardware to look much neater.

Stripboard - Cricklewood CQ25, (9 Tracks/25 Holes /Track) cut to 7 Tracks with 17 Holes/Track. 0.90p

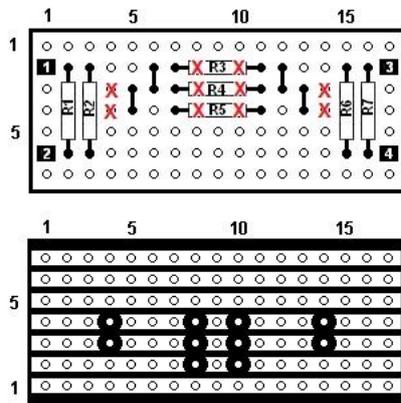
1 - 1k Cricklewood M1K0  
R2 - 1k5 Cricklewood M1K5  
R3 - 330k Cricklewood M330K  
R4 - 220k Cricklewood M220K  
R5 - 100k Cricklewood M100K  
R6 - 1k Cricklewood M1K0  
R7 - 1k5 Cricklewood M1K5  
(R1/R2 and R6/R7 make 600 Ohms.)  
(R3/R4/R5 makes 56.8k)

## Construction of the board

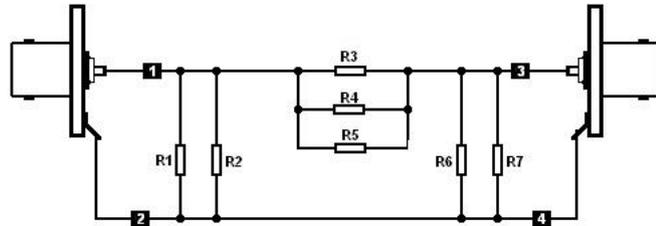
This is straight forward; ensure all tracks are cleanly cut without any shorting whiskers.

For connection to the BNC Jacks it is suggested that 22 SWG tails with optional sleeving are fitted to the board for direct connection to the Jacks.

The wires will be sufficient for freely mounting the board without any further fixtures due to its light-weight construction.

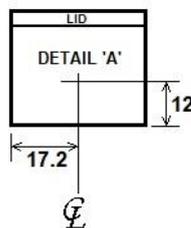


40dB PAD (NON-PRECISION)

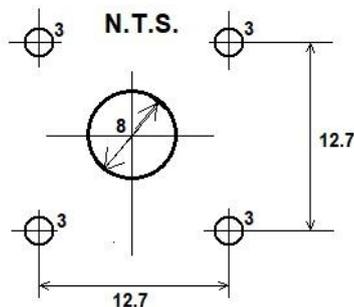


- R1 - 1k ) = 600 OHMS
- R2 - 1k5 )
- R3 - 330k )
- R4 - 220k ) = 56.8k
- R5 - 100k )
- R6 - 1k ) = 600 OHMS
- R7 - 1k5 )

## Box drilling



BOTH ENDS OF BOX.



## Testing

Because the attenuator is a Pi circuit, it is not possible to measure the resistance between the BNC inners owing to the presence of 600 Ohms at each end, connected by a common Ground.

You can check that there is approximately 600 Ohms between each of the BNC inners and outers; in fact it should measure nearer 593.8 Ohms. This is because each 600 Ohm will have a resistance path of 56.8k + 600 Ohms in parallel with it.

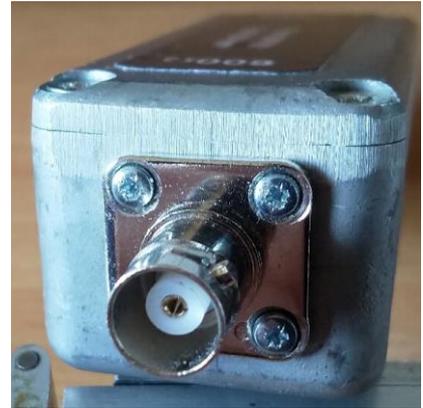
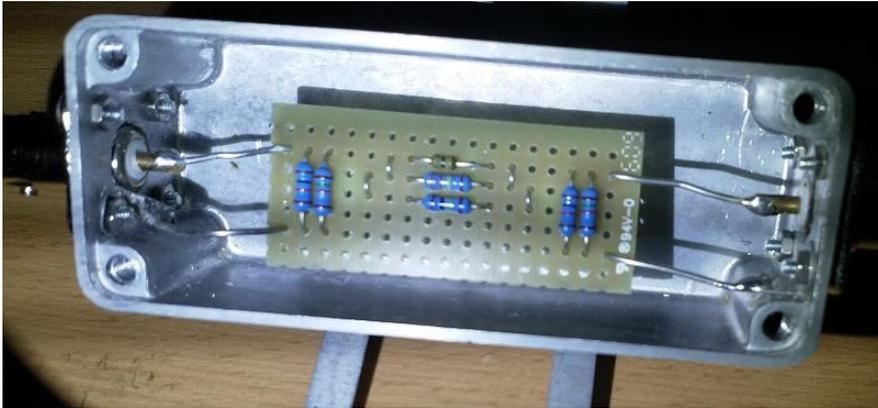
The best test would be a dynamic one, connecting either end to a 600 Ohm output signal generator, set to give 0dB as measured using a 't' piece.

Then if you measure the other end you should observe approximately -40dB attenuation.

If this is OK, then try a frequency sweep over the audio range of 20Hz to 20 kHz to ensure that the attenuator flatness is acceptable; the prototype was flat to 40 kHz.

Your signal generator must of course have constant amplitude over the audio range and likewise your RMS Voltmeter must have a flat response too.

Some physical views, note the neater 2mm fixing hardware.



Suggested Label.

