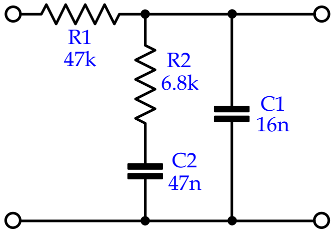
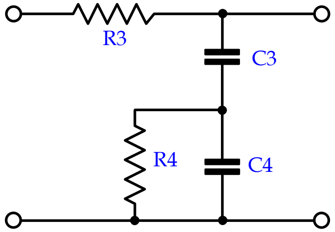
RIAA-1
Voltage driven

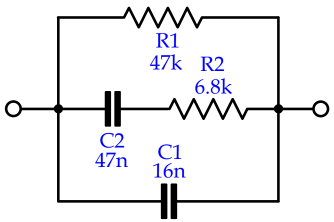


RIAA-2
Voltage driven

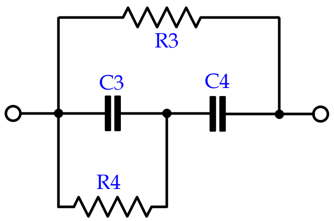


These tables give the relative values of R and C for ‘lumped’ networks capable of performing RIAA or similar equalisation where T_3 is the break point of the lowest frequency and T_1 that of the highest. The results are based on calculations published in Wireless World 1957 by W. H. Livy of E.M.I Studios London (now Abbey Road Studios). In 1982 I expanded the calculations to include a 4th variant and to show the numerical results of all the combinations of R and C to make choosing components easier. In 1985 the results were used to make a simple iterative program that enabled entry of any one component to calculate the other three. The ‘voltage driven’ networks should be inserted between a low output Z amplifier and high input Z amplifier to create a passive RIAA ‘phono stage’. The 2 terminal variants are suitable for inclusion in negative feedback loops or need to be ‘current driven’ with the output voltage developed across the network and amplified by a high input Z amplifier. **Keith Snook** ~ www.keith-snook.info

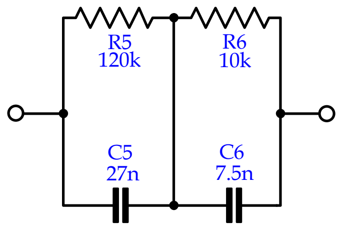
RIAA-1
Current driven



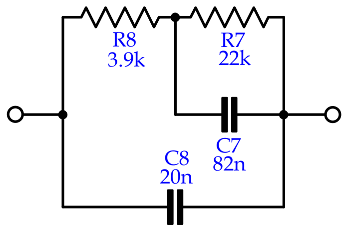
RIAA-2
Current driven



RIAA-3
Current driven only



RIAA-4
Current driven only



$$\frac{R_1}{R_2} = \frac{\left(T_1+T_3-T_2-\frac{T_1\cdot T_3}{T_2}\right)}{T_2} = 6.87736$$

$$R_2\cdot C_1 = \frac{T_1\cdot T_3}{\left(T_1+T_3-T_2-\frac{T_1\cdot T_3}{T_2}\right)} = 109.053\mu S$$

$$R_2\cdot C_2 = T2 = 318\mu s$$

$$R_1\cdot C_1 = \frac{T_1\cdot T_3}{T_2} = 750\mu s$$

$$R_1\cdot C_2 = \left(T_1+T_3-T_2-\frac{T_1\cdot T_3}{T_2}\right) = 2187\mu S$$

$$\frac{R_3}{R_4} = \frac{T_1+T3-T_2}{\left(T_2-\frac{T_1\cdot T_3}{T_2}\right)} = 12.40315$$

$$R_4\cdot C_3 = T_2 - \frac{T_1\cdot T_3}{(T_1+T_3-T_2)} = 236.7947\mu s$$

$$R_4\cdot C_4 = \frac{T_1\cdot T_3}{(T_1+T_3-T_2)} = 81.20512\mu s$$

$$R_3\cdot C_3 = T_1+T_3-T_2 = 2973\mu s$$

$$R_3\cdot C_4 = \frac{T_1\cdot T_3}{\left(T_2-\frac{T_1\cdot T_3}{(T_1+T_3-T_2)}\right)} = 1007.202\mu s$$

$$\frac{R_5}{R_6} = \left(\frac{T_3-T_2}{T_2-T_1}\right) = 11.7\dot{7}$$

$$R_6\cdot C_5 = T_3\cdot\left(\frac{T_2-T_1}{T_3-T_2}\right) = 270\mu s$$

$$R_6\cdot C_6 = T_1 = 75\mu s$$

$$R_5\cdot C_5 = T_3 = 3180\mu s$$

$$R_5\cdot C_6 = T_1\cdot\left(\frac{T_3-T_2}{T_2-T_1}\right) = 883.3\dot{3}$$

$$\frac{R_7}{R_8} = \frac{\left(T_1+T_3-T_2-\frac{T_1\cdot T_3}{T_2}\right)}{T_2} = 6.87736$$

$$R_8\cdot C_7 = T_2\cdot\frac{\left(T_1+T_3-\frac{T_1\cdot T_3}{T_2}\right)}{\left(T_1+T_3-T_2-\frac{T_1\cdot T_3}{T_2}\right)} = 364.2387\mu s$$

$$R_8\cdot C_8 = \frac{T_1\cdot T_3}{T_1+T_3-\left(\frac{T_1\cdot T_3}{T_2}\right)} = 95.20958\mu s$$

$$R_7\cdot C_7 = T_1+T_3-\left(\frac{T_1\cdot T_3}{T_2}\right) = 2505\mu s$$

$$R_7\cdot C_8 = \frac{T_1\cdot T_3}{T_2}\cdot\frac{\left(T_1+T_3-T_2-\frac{T_1\cdot T_3}{T_2}\right)}{\left(T_1+T_3-\frac{T_1\cdot T_3}{T_2}\right)} = 645.79\mu s$$