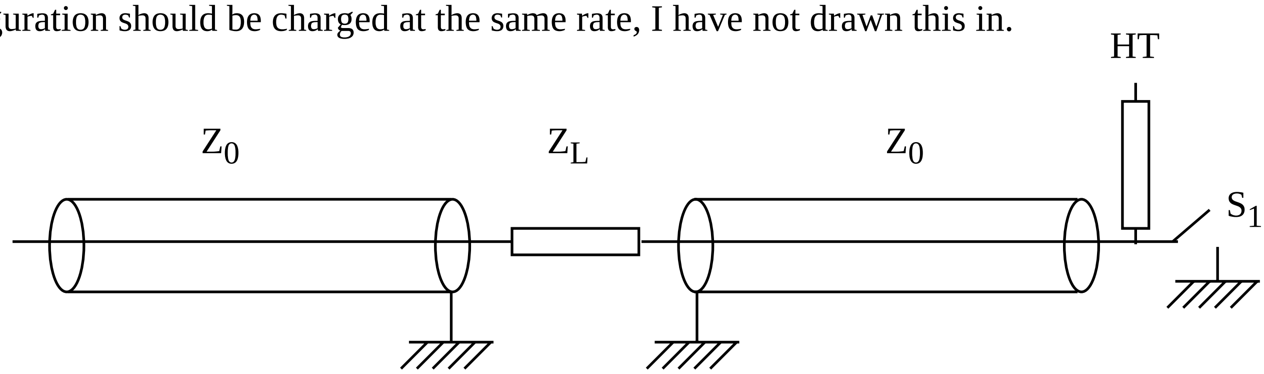
The following explains how the Blumlein configuration for transmission lines achieves the charge voltage into a matched load for a pulse length equal in length to the double transit time of one of two lines.

In this configuration two lines are charged and drive a load with an impedance twice that of a single line.
Note that to avoid the charging current flowing though the load both sides of the configuration should be charged at the same rate, I have not drawn this in.

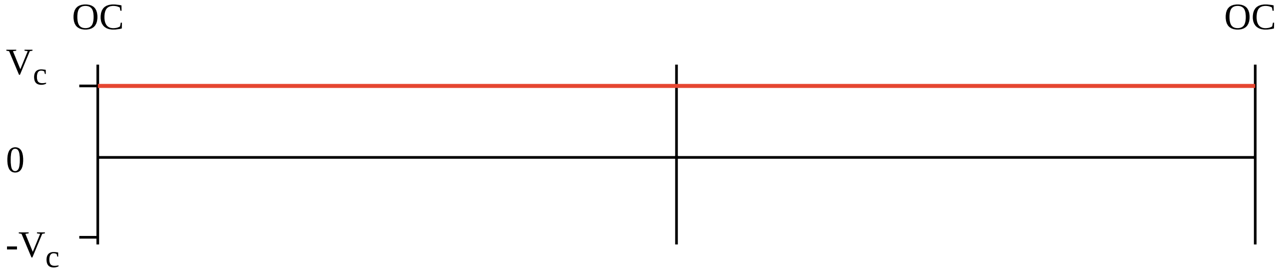


The matched condition is $Z_L = 2\ Z_0$

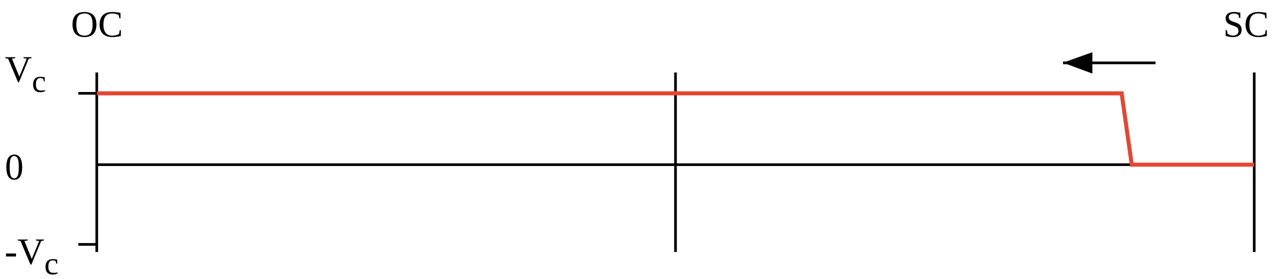
Reflected Voltage = R
Transmitted Voltage = T
Incident line impedance = Z_0
Terminating line impedance = Z_T

$$T = \frac{2\ Z_T}{Z_0 + Z_T} \qquad R = \frac{Z_0 - Z_T}{Z_0 + Z_T}$$

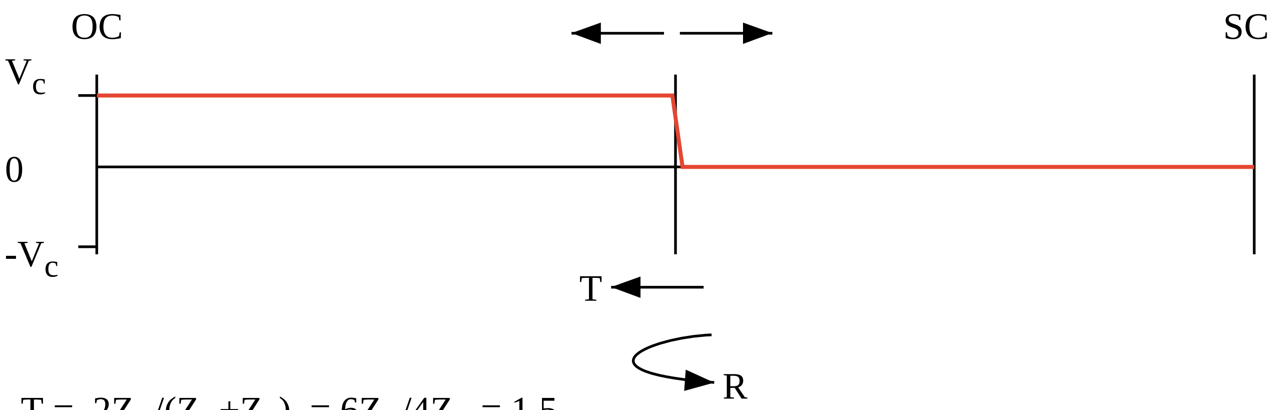
The Initial State
OC = Open Circuit, SC = Short Circuit V_c = charge voltage



The switch S_1 closes



The edge reaches the load

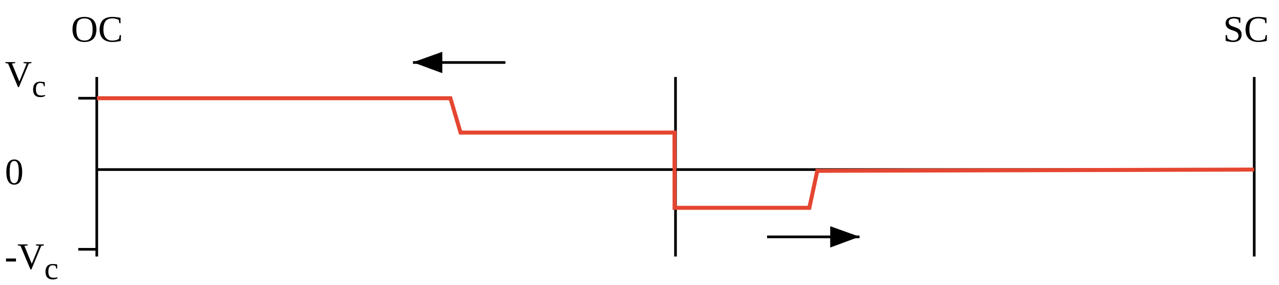


$T = 2Z_T/(Z_T+Z_0) = 6Z_T/4Z_T = 1.5$

$R= (Z_T-Z_0)/(Z_T+Z_0) = 2\ Z_0/\ 4\ Z_0 = 0.5$

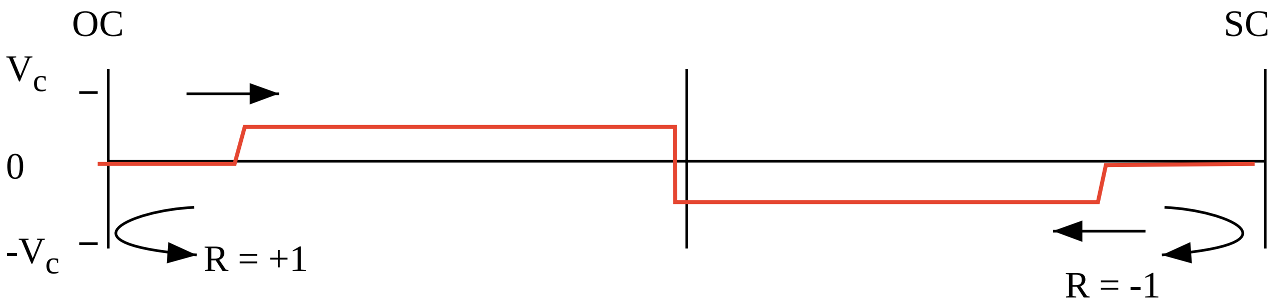
Of the tranmitted pulse this is shared between the load and the left line in the ratio 2 : 1 (The ratio of their impedances)
Hence the voltages on the left of the line as a $-V_C/2$ edge $+V_c = V_c/2$
On the right of the line the voltage is $-V_c/2$ as the initial $-V_c$ edge is reflected with magnitude 0.5.

So we have



The voltage across the load is V_c

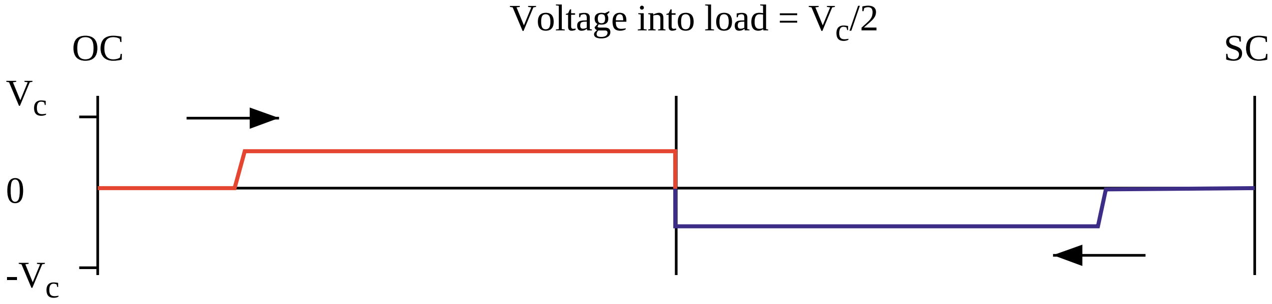
The edges reflect from the ends.

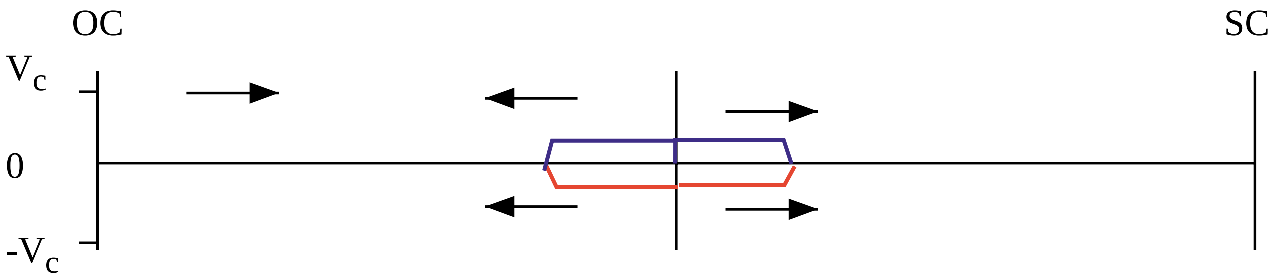


When the edges return to the load we have to consider the contribution to the load voltage from each and the splitting of the two edges into four.

from the left
Incident $-V_c/2$ T = 1.5 R= 0.5 Voltage into right line = $-V_c/4$
Voltage into lenft line = $-V_c/4$
Voltage into load = $-V_c/2$

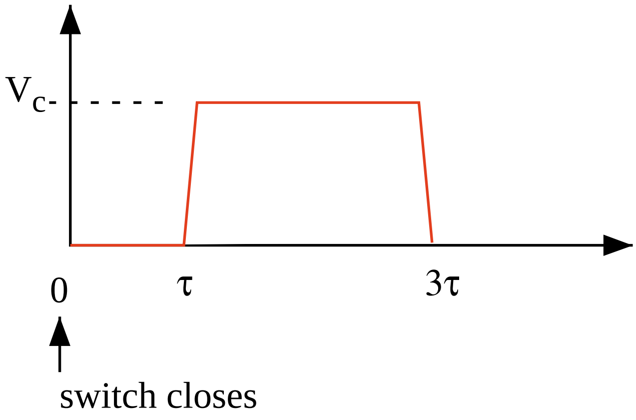
from the right
Incident $V_c/2$ T = 1.5 R= 0.5 Voltage into right line = $V_c/4$
Voltage into lenft line = $V_c/4$
Voltage into load = $V_c/2$



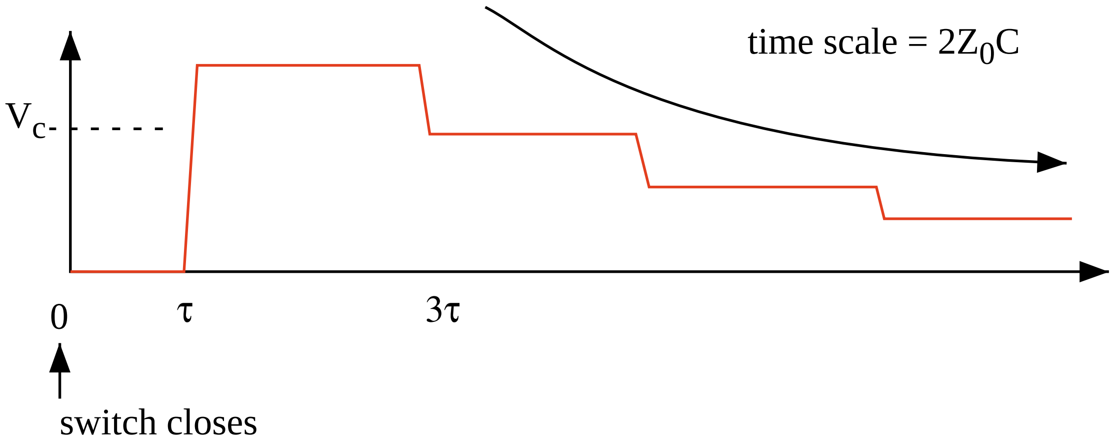


These all cancel out leaving no charge on the line.

The voltage pulse across the load is therefore



It is similarly shown that if $Z_L > 2Z_0$ The voltage on the load follows:-



It is similarly shown that if $Z_L < 2Z_0$ The voltage on the load follows:-