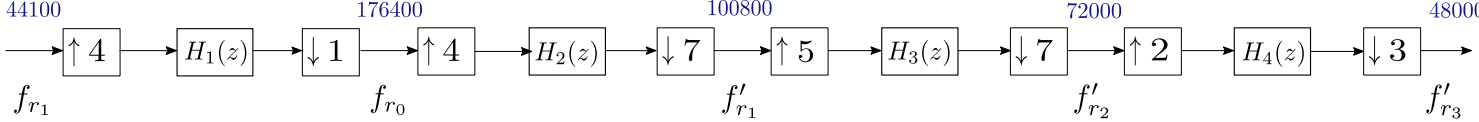

$D_1 = \frac{M_1}{L_1} = \frac{4}{1}$

$f_s = \frac{f_{r_1}}{2} = \frac{44100}{2} = 22050\,\text{Hz}$

$f_{max_1} = 4 * f_{r_1} = 176400\,\text{Hz}$

$\omega_{c_1} = \frac{f_{r_1} - f_s}{\frac{f_{max_1}}{2}} = 0.2500$

$D'_1 = \frac{M'_1}{L'_1} = \frac{7}{4}$

$f_s = 22050\,\text{Hz}$

$f'_{max_1} = 4 * f_{r_0}$
$= 705600\,\text{Hz}$

$\omega'_{c_1} = \frac{f'_{r_1} - f_s}{\frac{f'_{max_1}}{2}} = 0.2232$

$D'_2 = \frac{M'_2}{L'_2} = \frac{7}{5}$

$f_s = 22050\,\text{Hz}$

$f'_{max_2} = 5 * f'_{r_1}$
$= 504000\,\text{Hz}$

$\omega'_{c_2} = \frac{f'_{r_2} - f_s}{\frac{f'_{max_2}}{2}} = 0.1982$

$D'_3 = \frac{M'_3}{L'_3} = \frac{3}{2}$

$f_s = 22050\,\text{Hz}$

$f'_{max_3} = 2 * f'_{r_2}$
$= 144000\,\text{Hz}$

$\omega'_{c_3} = \frac{f'_{r_3} - f_s}{\frac{f'_{max_3}}{2}} = 0.3604$