

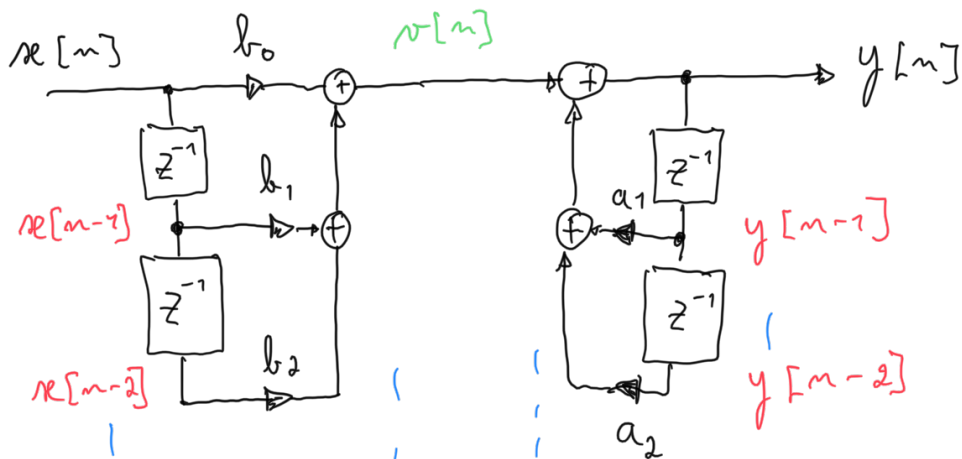
FPS 06DEC 2021

Lecture

$$y[n] = \underbrace{b_0 x[n] + b_1 x[n-1] + b_2 x[n-2]}_{\equiv v[n]} + a_1 y[n-1] + a_2 y[n-2]$$

$$H(z) = \frac{Y(z)}{X(z)} = \frac{b_0 + b_1 z^{-1} + b_2 z^{-2}}{1 - a_1 z^{-1} - a_2 z^{-2}}, \text{ causal}$$

"starts from rest"



TYPE 1 Direct

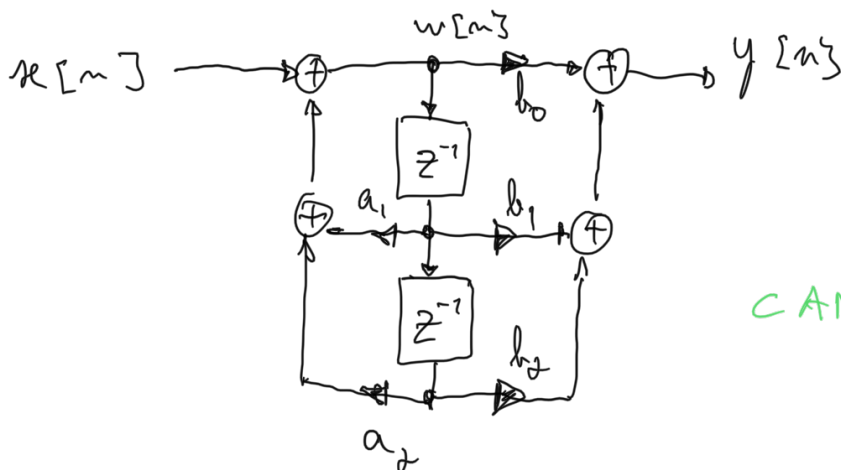
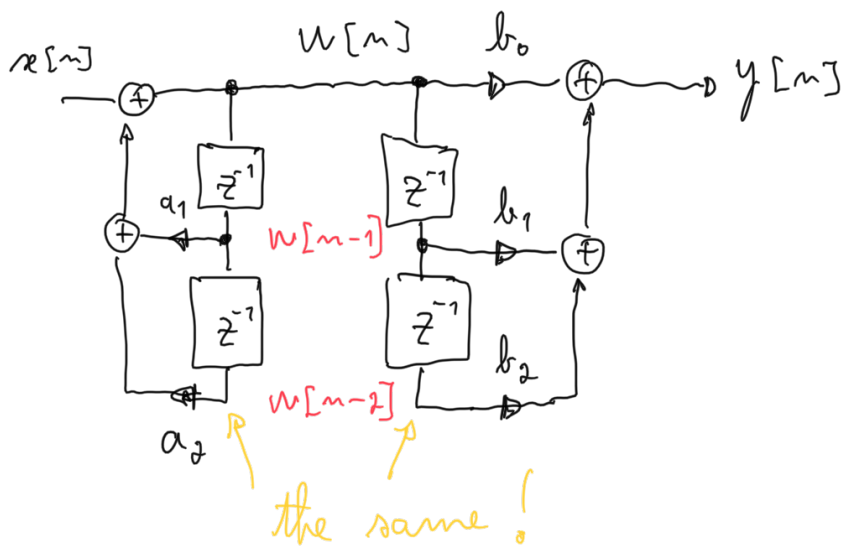
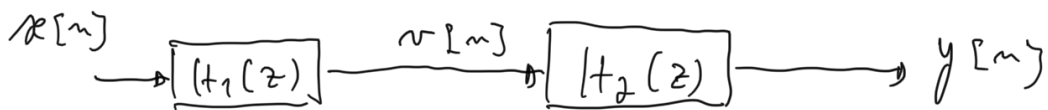
(NON-CANONIC!)

$$H_1(z) =$$

$$= b_0 + b_1 z^{-1} + b_2 z^{-2}$$

$$H_2(z) =$$

$$= \frac{1}{1 - a_1 z^{-1} - a_2 z^{-2}}$$

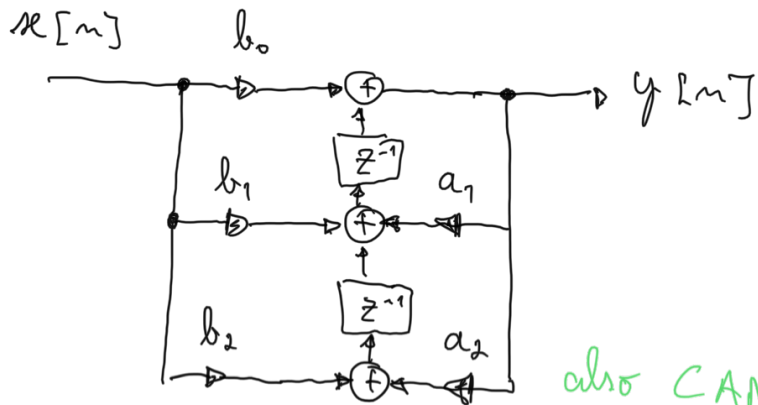


CANONIC!

DIRECT TYPE 2

DIRECT FORM

TRANSPOSED STRUCTURE :



also CANONIC!