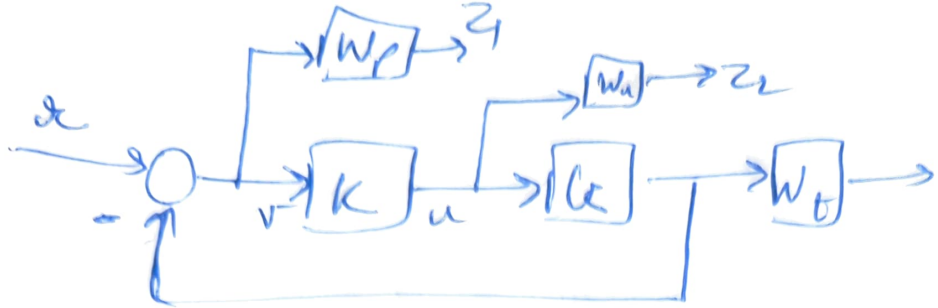
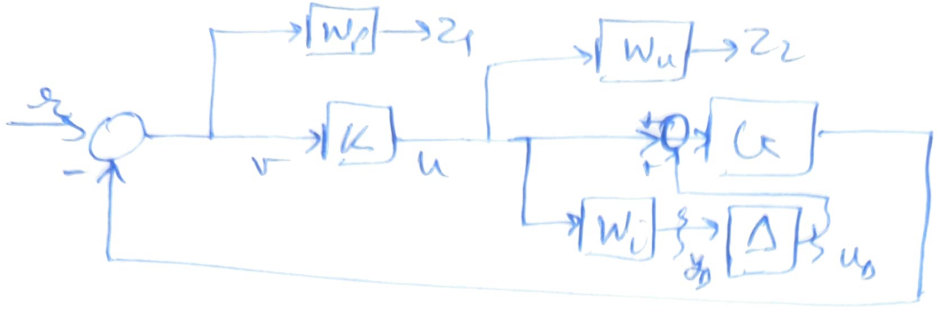


$$z = \begin{pmatrix} z_1 \\ z_2 \end{pmatrix} \Rightarrow z_1 = W_p(r - GKu) = W_p r - W_p GKu$$

$$z_2 = W_u u$$

$$v = r - GKu$$

$$\begin{bmatrix} z_1 \\ z_2 \\ v \end{bmatrix} = \begin{bmatrix} W_p & -W_p GK \\ O_{2\times 2} & W_u \\ I_{2\times 2} & -GK \end{bmatrix} \begin{bmatrix} r \\ u \end{bmatrix}$$



$$y_\Delta = W_i\, u$$

$$z_1 = W_p\,(r - G\,(u_\Delta + u)) = W_p r - W_p G u_\Delta - W_p G$$

$$z_2 = W_u\, u$$

$$v = r - G\,(u_\Delta + u)$$

$$= r - G u_\Delta - G u$$

$$\begin{bmatrix} y_\Delta \\ z_1 \\ z_2 \\ v \end{bmatrix} = \underbrace{\begin{bmatrix} 0_{2\times 2} & 0_{2\times 2} & W_i \\ -W_p G & W_p & -W_p G \\ 0_{2\times 2} & 0_{2\times 2} & W_u \\ -K & I_{2\times 2} & -G \end{bmatrix}}_{P\ (\text{hinfsyn})} \begin{bmatrix} u_\Delta \\ r \\ u \end{bmatrix}$$