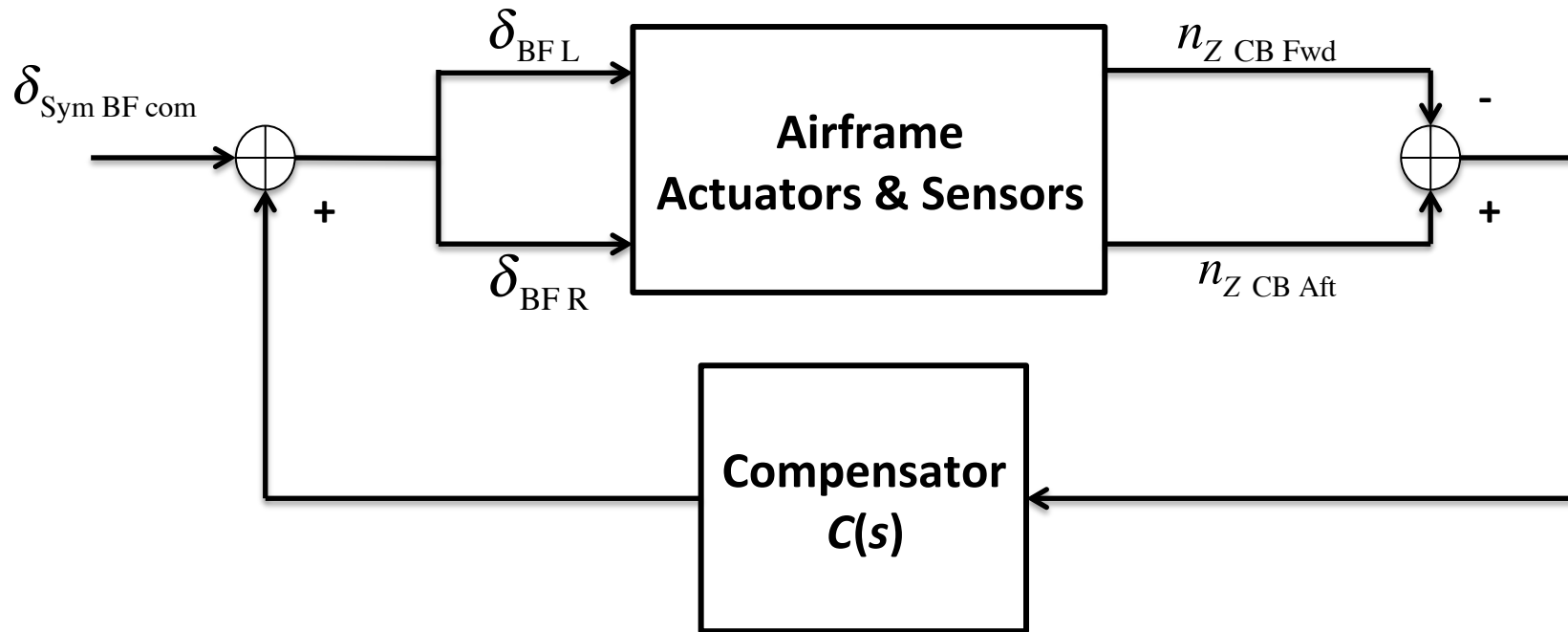


Controller Architecture



$$C(s) = K_B \frac{(s^2 + 2\zeta_N \omega_{\text{Notch}} s + \omega_{\text{Notch}}^2)}{(s^2 + 2\zeta_D \omega_{\text{Notch}} s + \omega_{\text{Notch}}^2)(s + P_{LP})} \text{ rad/ft/sec}^2$$

Bode Gain Schedule

For $TAS < 34$ m/sec, $K_B = 0.0010$ rad/ft/sec²

For $TAS > 34$ m/sec, K_B is linear with TAS

$$\begin{aligned} K_B &= \frac{(0.0020 - 0.0010)}{(36 - 34)}(TAS - 34) + 0.001 = \frac{0.0010}{2}(TAS - 34) + 0.001 \\ &= 0.0005TAS - 0.016 \end{aligned}$$

Re-Tuned Results – Parameters, Min Margins

$$C(s) = \frac{K_{Bode} \left(1 + (2(0.1)/91)s + s^2 / 91^2\right)}{\left(1 + (2(0.5)/91)s + s^2 / 91^2\right)(1 + s / 100)}$$

Parameter Schedule

True Airspeed, m/sec	Gain, K_{Bode} rad/ft/s ²	Notch $\zeta_{N \text{ and } D}$	Low Pass
33 and below	0.0010	0.5, 0.1	100
34	0.0010	0.5, 0.1	100
35	0.0015	0.5, 0.1	100
36	0.0020	0.5, 0.1	100

Min 2-accel input/2-flap output Single-Loop Margins

True Airspeed m/sec	GM, dB	GM Frequency rad/sec	PM, deg	PM Frequency rad/sec
23	21.6	59.7	inf	-
28	16.5	19.9	inf	-
33	9.9, -40.6	24.0, 37.0	71.4, -68.8	40.2, 33.4
34	8.8, -9.2	25.0, 36.9	57.2, -46.3	39.8, 33.4
35	5.6, -5.0	25.2, 37.4	51.2, -34.1	43.2, 32.6
36	3.7, -2.7	25.2, 37.1	31.0, -27.8	45.8, 32.1

Minimum Stability Margins

Mimumum 2x2 Margins

