

Precoder constellation expansion

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Echo path inverts part of the precoder

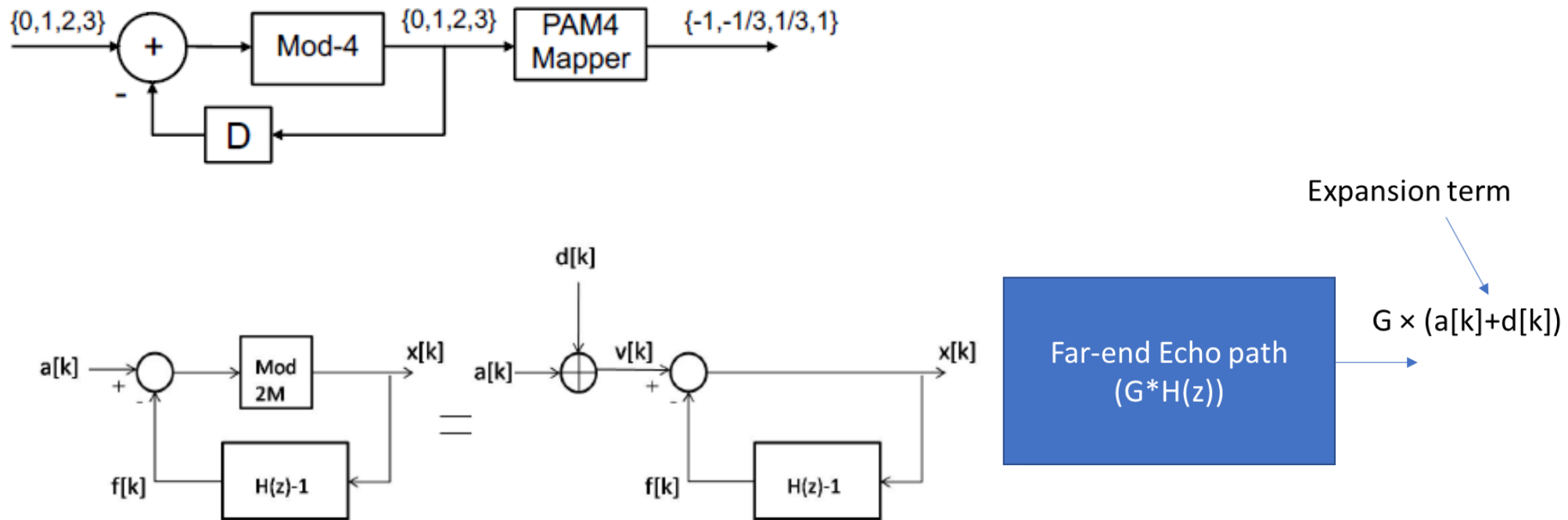


Figure 1.3: Tomlinson-Harashima precoder and linearized description

Expansion is seen relative to the extent that the channel or echo path inverts the feedback of the precoder. To the extent the channel and the precoder mismatch, the $d[k]$ is further filtered by the remainder of the transfer function after dividing out the channel and the precoder.

Question – how big is “G×d[k]”?

- We can estimate it from MDI return loss RMS value plus line attenuation
 - Looks like MDI RL can be bounded better than 16 dB loss, possibly 20 dB (bhagwat_3ch_03_0918.pdf)
 - Mid band line attenuation ~ 16 dB -> far end echo attenuated 32 to 36 dB relative to near end tx signal -> $G < 0.025$
 - $d[k] = +/- 3x$ full scale signal, -> voltage expansion < **7.5%** -> **SMALL...**

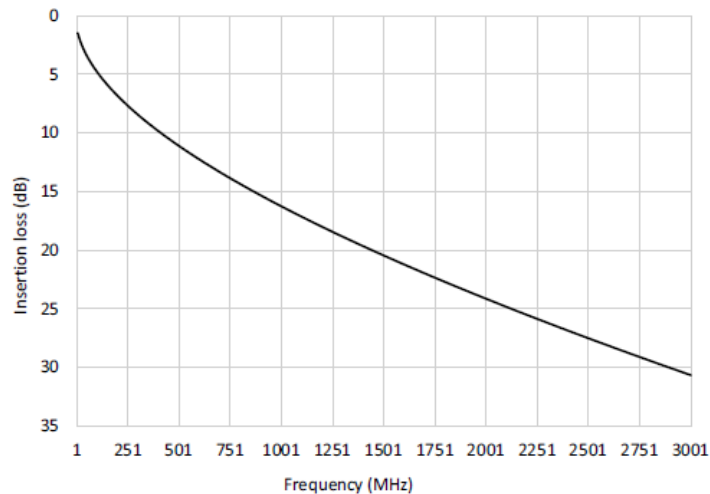


Figure 150–17—Insertion loss calculated using Equation (150–6)

