

509 **Appendix**

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511 Optimized gains for the three controller architectures. G1 is shoulder angle gain; G2 is  
 512 elbow angle gain; G3 is shoulder angular velocity gain; and G4 is elbow angular velocity  
 513 gain.

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515 24-parameter controller

<b>muscle</b>	<b>G1 (rad<sup>-1</sup>)</b>	<b>G2(rad<sup>-1</sup>)</b>	<b>G3(rad<sup>-1</sup> s)</b>	<b>G4(rad<sup>-1</sup> s)</b>
Anterior Deltoid	-1.018	0.332	-0.157	-0.015
Posterior Deltoid	1.134	0.156	0.179	0.057
Brachialis	-0.007	-1.186	-0.032	-0.103
Triceps (short head)	-0.174	1.032	0.011	0.076
Triceps (long head)	0.491	0.975	0.118	0.089
Biceps	-0.434	-0.722	-0.099	-0.070

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517 16-parameter controller

<b>muscle</b>	<b>G1 (rad<sup>-1</sup>)</b>	<b>G2(rad<sup>-1</sup>)</b>	<b>G3(rad<sup>-1</sup> s)</b>	<b>G4(rad<sup>-1</sup> s)</b>
Anterior Deltoid	-1.021	0	-0.152	0
Posterior Deltoid	1.111	0	0.148	0
Brachialis	0	-1.319	0	-0.094
Triceps (short head)	0	1.040	0	0.072
Triceps (long head)	0.456	0.929	0.093	0.086
Biceps	-0.493	-0.676	-0.098	-0.077

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519 2-parameter controller

<b>muscle</b>	<b>G1 (rad<sup>-1</sup>)</b>	<b>G2(rad<sup>-1</sup>)</b>	<b>G3(rad<sup>-1</sup> s)</b>	<b>G4(rad<sup>-1</sup> s)</b>
Anterior Deltoid	-0.962	0	-0.128	0
Posterior Deltoid	0.962	0	0.128	0
Brachialis	0	-0.962	0	-0.128
Triceps (short head)	0	0.962	0	0.128
Triceps (long head)	0.962	0.962	0.128	0.128
Biceps	-0.962	-0.962	-0.128	-0.128

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