Table 1: Baxter Controller Design Constraint Parameters

Joint #	DC_{max} (dB)	P_{max} (dB)	GM_{min} (dB)	PM_{min} (deg)
1	1	3	3	20
2	1	5	3	20
3	1	3	3	20
4	1	5	3	20
5	1	4	3	20
6	2	7	3	20
7	1	3	3	20

Table 2: Simulated Arm Dynamic Model Parameters

Variable Name:	Spring Constant (x1000)	Link-Side Friction Coefficient	Coupled Friction Coefficient	Motor-Side Friction Coefficient
Symbol:	K	D_ℓ	D_J	D_m
Units:	$N/_m$	$kg \cdot m^2/_s$	$kg \cdot m^2/_s$	$kg \cdot m^2/_s$
q_1	259	450	158	1e-6
q_2	190	455	285	1e-6
q_3	98.3	200	230	1e-6
q_4	119	350	435	1e-6
q_5	15.5	320	112	1e-6
q_6	16.1	325	220	1e-6
q_7	8.07	140	157	1e-6

Table 3: Simulated Arm Dynamic Model Parameters II

Variable Name:	Gear Ratio	Motor Inertia(x10^{-6})	Link mass
Symbol:	N	I_m	m
Units:	-	$kg \cdot m^2$	kg
q_1	6529	1.92	18
q_2	2737	2.48	9
q_3	5074	1.44	9
q_4	4631	2.59	7
q_5	4560	0.596	4
q_6	3611	0.723	2.5
q_7	1674	0.631	17

Table 4: Simulated Arm Dynamic Model Parameters III

Link	Vector to CoM (m) (in ith frame)	Inertia Matrix ($kg \cdot m^2$)
1	$\begin{bmatrix} 0 \\ 0.018 \\ -0.043 \end{bmatrix}$	$\begin{bmatrix} 0.4291 & 0 & 0 \\ 0 & 0.2833 & 0.0219 \\ 0 & 0.0219 & 0.1368 \end{bmatrix}$
2	$\begin{bmatrix} -0.003 \\ -0.283 \\ -0.01 \end{bmatrix}$	$\begin{bmatrix} 1.8017 & -0.0046 & 0.0037 \\ -0.0046 & 0.143 & -0.0245 \\ 0.0037 & -0.0245 & 0.8669 \end{bmatrix}$
3	$\begin{bmatrix} 0 \\ -0.004 \\ -0.118 \end{bmatrix}$	$\begin{bmatrix} 2.4005 & 0.001 & 0 \\ 0.001 & 2.9613 & -0.0432 \\ 0 & -0.0432 & 0.0681 \end{bmatrix}$
4	$\begin{bmatrix} 0.002 \\ 0.104 \\ 0.003 \end{bmatrix}$	$\begin{bmatrix} 0.1648 & -0.0005 & 0 \\ -0.0005 & 0.0211 & -0.0002 \\ 0 & -0.0002 & 0.1367 \end{bmatrix}$
5	$\begin{bmatrix} -0.001 \\ -0.197 \\ -0.165 \end{bmatrix}$	$\begin{bmatrix} 0.8221 & -0.0008 & -0.0007 \\ -0.0008 & 1.1109 & -0.357 \\ -0.0007 & -0.357 & 0.2062 \end{bmatrix}$
6	$\begin{bmatrix} 0.003 \\ -0.04 \\ -0.004 \end{bmatrix}$	$\begin{bmatrix} 0.028 & 0.003 & 0 \\ 0.003 & 0.0131 & -0.0004 \\ 0 & -0.0004 & 0.201 \end{bmatrix}$
7	$\begin{bmatrix} 0.015 \\ 0.019 \\ 0.53 \end{bmatrix}$	$\begin{bmatrix} 4.9914 & -0.0048 & -0.1352 \\ -0.0048 & 4.9141 & -0.1712 \\ -0.1352 & -0.1712 & 0.024 \end{bmatrix}$

Table 5: Simulated Arm Kinematic Parameters

Link	Axis of Rotation (in ith frame)	Joint Limits (rad)
1	$\overrightarrow{z}$	-3.979, 2.234
2	$\overrightarrow{-y}$	-3.892, 2.199
3	$\overrightarrow{z}$	-4.538, 2.339
4	$\overrightarrow{-y}$	-2.182, 1.972
5	$\overrightarrow{z}$	-5.062, 1.85
6	$\overrightarrow{-y}$	-3.211, 3.107
7	$\overrightarrow{z}$	-6.283, 2.618

Table 6: Simulated Arm Joint Vectors

Link Vector	Reference Frame	Values (m)
$P_{0,1}$	0	$\begin{bmatrix} 0 & 0 & 0.48 \end{bmatrix}^T$
$P_{1,2}$	1	$\begin{bmatrix} 0 & 0 & 0 \end{bmatrix}^T$
$P_{2,3}$	2	$\begin{bmatrix} 0 & -0.37 & 1.06 \end{bmatrix}^T$
$P_{3,4}$	3	$\begin{bmatrix} 0 & 0 & 0 \end{bmatrix}^T$
$P_{4,5}$	4	$\begin{bmatrix} 0 & 0.28 & 1.18 \end{bmatrix}^T$
$P_{5,6}$	5	$\begin{bmatrix} 0 & 0 & 0 \end{bmatrix}^T$
$P_{6,7}$	6	$\begin{bmatrix} 0 & 0 & 0 \end{bmatrix}^T$
$P_{7,EE}$	7	$\begin{bmatrix} 0 & 0 & 0.37 \end{bmatrix}^T$

Table 7: Simulated Arm Dynamic Parameters for Additional Load

Variable Name	Symbol	Units	Value
Mass	m_L	kg	2700
Inertia Matrix	I_L	$kg \cdot m^2$	$\begin{bmatrix} 5120 & -165 & 610 \\ -165 & 3660 & 180 \\ 610 & 180 & 5150 \end{bmatrix}$
Vector to CoM in T Frame	$p_{T,L}$	m	$\begin{bmatrix} 0.8 \\ 0.01 \\ 1.55 \end{bmatrix}$