To: Simulink Multi-body Dynamics Working Group (SMBDWG)
From: Eric Stoneking
Date:
Subject: Nomenclature from 42

Table 1: Common Reference Frames

N	Inertial Frame (N = Newton)
L	Local Vertical-Local Horizontal
R	Command Frame (R = Reference)
B	Body Frame

Table 2: Commonly-used Expressions

Written	Spoken	Coded
${}^{N}\vec{\omega}^{B}$	Angular velocity of B in N	`wbn, SC[i].B[j].wn`
B^*	Mass center of B, "B star"	`SC[i].B[j].cm`
${}^{N}\vec{v}^{B^*}$	Velocity of B^* in N	`SC[i].B[j].vn`
${}^{B}C^{N}$	DCM of B in N (or from N to B)	`CBN, SC[i].B[j].CN`
${}^{B}q^{N}$	Quaternion of B in N (or from N to B)	`qbn, SC[i].B[j].qn`
${}^{A}v$	Components of v in A, v expressed in A	`va`

Table 3: Common Constructions

Written	Coded
${}^{A}v = {}^{A}C^{B}\,{}^{B}v$	`MxV(CAB,vb,va)`
${}^{A}v = {}^{B}v\,{}^{B}C^{A}$	`VxM(vb,CBA,va)`
${}^{A}v = ({}^{B}C^{A})^{T}\,{}^{B}v$	`MTxV(CBA,vb,va)`
${}^{A}v = {}^{B}v({}^{A}C^{B})^{T}$	`VxMT(vb,CAB,va)`
Convert ${}^{B}C^{N}$ to ${}^{B}q^{N}$	`C2Q(CBN,qbn)`
Convert ${}^{B}q^{N}$ to ${}^{B}C^{N}$	`Q2C(qbn,CBN)`
Convert Euler Angles (2-1-3 Sequence) to DCM	`A2C(213,ang1,ang2,ang3,C)`
${}^{N}C^{R} = ({}^{R}C^{N})^{T}$	`MT(CRN,CNR)`
${}^{B}C^{R} = {}^{B}C^{N}({}^{R}C^{N})^{T} = {}^{B}C^{N}\,{}^{N}C^{R}$	`MxMT(CBN,CRN,CBR)`
${}^{B}q^{R} = {}^{B}q^{N} \otimes {}^{N}q^{R}$	`QxQT(qbn,qrn,qbr)`