```
syms gamma delta w_Io w_Orb t R_orb
T_B_J = troty(gamma-deg2rad(90))
```

T_B_J =

$$\begin{pmatrix} \cos\left(\gamma-\frac{\pi}{2}\right) & 0 & \sin\left(\gamma-\frac{\pi}{2}\right) & 0 \\ 0 & 1 & 0 & 0 \\ -\sin\left(\gamma-\frac{\pi}{2}\right) & 0 & \cos\left(\gamma-\frac{\pi}{2}\right) & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

```
T_J_I = trotz(delta)*troty(w_Orb)*transl(R_orb,0,0)
```

T_J_I =

$$\begin{pmatrix} \cos(\delta)\cos(w_{\mathrm{Orb}}) & -\sin(\delta) & \cos(\delta)\sin(w_{\mathrm{Orb}}) & R_{\mathrm{orb}}\cos(\delta)\cos(w_{\mathrm{Orb}}) \\ \sin(\delta)\cos(w_{\mathrm{Orb}}) & \cos(\delta) & \sin(\delta)\sin(w_{\mathrm{Orb}}) & R_{\mathrm{orb}}\sin(\delta)\cos(w_{\mathrm{Orb}}) \\ -\sin(w_{\mathrm{Orb}}) & 0 & \cos(w_{\mathrm{Orb}}) & -R_{\mathrm{orb}}\sin(w_{\mathrm{Orb}}) \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

```
T_B_I = T_B_J*T_J_I
```

T_B_I =

$$\begin{pmatrix} \cos(\delta)\,\sigma_2\cos(w_{\mathrm{Orb}}) - \sigma_1\sin(w_{\mathrm{Orb}}) & -\sin(\delta)\,\sigma_2 & \cos(w_{\mathrm{Orb}})\,\sigma_1 + \cos(\delta)\,\sigma_2\sin(w_{\mathrm{Orb}}) & R_{\mathrm{orb}}\cos(\delta)\,\sigma_2\cos(\\ \sin(\delta)\cos(w_{\mathrm{Orb}}) & \cos(\delta) & \sin(\delta)\sin(w_{\mathrm{Orb}}) & R_{\mathrm{orb}}\sin \\ -\sigma_2\sin(w_{\mathrm{Orb}}) - \cos(\delta)\cos(w_{\mathrm{Orb}})\,\sigma_1 & \sin(\delta)\,\sigma_1 & \sigma_2\cos(w_{\mathrm{Orb}}) - \cos(\delta)\,\sigma_1\sin(w_{\mathrm{Orb}}) & -R_{\mathrm{orb}}\,\sigma_2\sin(w_{\mathrm{Orb}}) \cdot \\ 0 & 0 & 0 & \end{pmatrix}$$

where

$$\sigma_1 = \sin\left(\gamma-\frac{\pi}{2}\right)$$

$$\sigma_2 = \cos\left(\gamma-\frac{\pi}{2}\right)$$