

# **Robotics, CpE 360**



## **Six Modules Report**

**Prof. Tarek M. Sobh**

**University of Bridgeport**

- *Kostyantyn I. Vovk*
- *Bishad J. Ghimire*

### Introduction:

We were to design a generic mathematical program that takes the generic DH parameter table and displays the six modules, namely Forward Kinematics, Inverse Kinematics, Forward Velocity, Inverse Velocity, Forward Acceleration and Inverse Acceleration.

The eventual goal was to implement these modules in the *Mathematica 4.0* software package.

### Discussion:

While our implementation has not achieved all the desired goals, for reasons to be discussed below, the non-trivial part of the implementations, namely the generation of the generic *Jacobian Matrix* from the generic DH parameter table, has been achieved. This marks a development of the most significance to our project. Besides, another important progress point was the computation of the time derivative of the *Jacobian Matrix*  $dJ / dt$ .

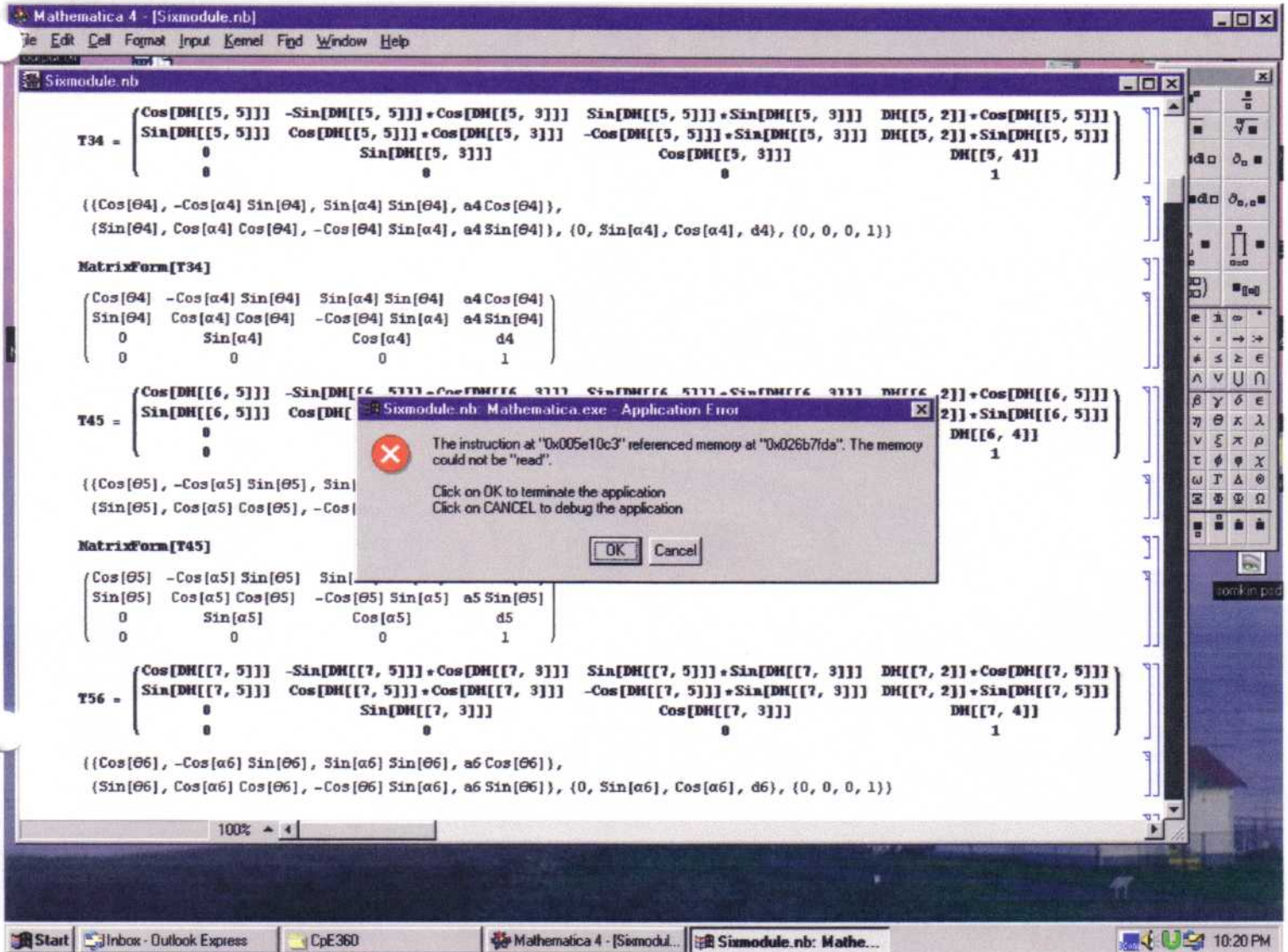
For the inverse acceleration calculations a necessary value was the inverse of the *Jacobian Matrix*. This calculation was attempted repeatedly, mostly resulting in out of memory exception errors. Only after the virtual memory size of the Windows NT Pentium II computer was set to 512 MB did we achieve a result for the above computation. It took the *Mathematica 4.0* kernel approximately 10 minutes to produce the result. The resulting inverse *Jacobian Matrix* spanned 488 pages, excerpts of which are attached. It was not deemed necessary to print the entire result, but some key features of the process of inverting the *Jacobian Matrix* have been highlighted.

After the result was computed, *Mathematica 4.0* refused to perform any operations upon the resulting crash and accompanied any attempt to operate on any of the stored inputs with an Access Violation crash. Moreover, it also refused to open the saved notebook file, again crashing at any attempt to do so. The only thing that was left to us was the Mathematica output in Postscript (pdf) form. All result printouts that are attached with this report have been generated from the postscript file, we have not been successful at opening *Mathematica*'s own notebook file. A screenshot of it in the process of crashing is included below.

For your final  
project, be realistic  
as per our discussion  
yesterday

Welcome  
to the  
real world!  
Imagine  
a 100+  
d.o.f.  
Disney  
Robot  
+ think of  
approximations  
like discussed  
in class





The above screenshot best illustrates our futile attempts at opening the Mathematica notebook file in order to complete the project.

### Conclusion:

Unfortunately, our results have not been as successful as we had hoped. However, we did not yet give up, there still remains hope to solve the problem. One possible solution would be to interface directly with the Mathematica kernel using C++ and thus completely bypassing the unstable and not robust front-end.

In[1]:= J =

```

      H- a1 * Cos@q1D + a6 * Cos@q6DL * Sin@a1D * Sin@q1D  H- a2 * Cos@q2D + a6 * Cos@q6DL * Sin@a2D * Sin
      - Cos@q1D * Sin@a1D H- a1 * Sin@q1D + a6 * Sin@q6DL  - Cos@q2D * Sin@a2D H- a2 * Sin@q2D + a6 * Sin@
      H- d1 + d6L * Cos@a1D                                     H- d2 + d6L * Cos@a2D
      Sin@a1D * Sin@q1D                                         Sin@a2D * Sin@q2D
      - Cos@q1D * Sin@a1D                                       - Cos@q2D * Sin@a2D
      Cos@a1D                                                    Cos@a2D
      K
      V
      {

```

Out[1]= 88H- a1 Cos@q1D + a6 Cos@q6DL Sin@a1D Sin@q1D, H- a2 Cos@q2D + a6 Cos@q6DL Sin@a2D Sin@q2D,  
H- a3 Cos@q3D + a6 Cos@q6DL Sin@a3D Sin@q3D, H- a4 Cos@q4D + a6 Cos@q6DL Sin@a4D Sin@q4D,  
H- a5 Cos@q5D + a6 Cos@q6DL Sin@a5D Sin@q5D, H- a5 Cos@q5D + a6 Cos@q6DL Sin@a6D Sin@q6D<,  
8- Cos@q1D Sin@a1D H- a1 Sin@q1D + a6 Sin@q6DL, - Cos@q2D Sin@a2D H- a2 Sin@q2D + a6 Sin@q6DL,  
- Cos@q3D Sin@a3D H- a3 Sin@q3D + a6 Sin@q6DL, - Cos@q4D Sin@a4D H- a4 Sin@q4D + a6 Sin@q6DL,  
- Cos@q5D Sin@a5D H- a5 Sin@q5D + a6 Sin@q6DL, - Cos@q6D Sin@a6D H- a5 Sin@q5D + a6 Sin@q6DL<,  
8H- d1 + d6L Cos@a1D, H- d2 + d6L Cos@a2D, H- d3 + d6L Cos@a3D, H- d4 + d6L Cos@a4D,  
H- d5 + d6L Cos@a5D, H- d5 + d6L Cos@a6D<, 8Sin@a1D Sin@q1D, Sin@a2D Sin@q2D,  
Sin@a3D Sin@q3D, Sin@a4D Sin@q4D, Sin@a5D Sin@q5D, Sin@a6D Sin@q6D<,  
8- Cos@q1D Sin@a1D, - Cos@q2D Sin@a2D, - Cos@q3D Sin@a3D, - Cos@q4D Sin@a4D, - Cos@q5D Sin@a5D,  
- Cos@q6D Sin@a6D<, 8Cos@a1D, Cos@a2D, Cos@a3D, Cos@a4D, Cos@a4D, Cos@a6D<<

In[2]:= Jdot = Dt@J, tD

Out[2]= 88Cos@q1D H- a1 Cos@q1D + a6 Cos@q6DL Dt@q1, tD Sin@a1D +  
Cos@a1D H- a1 Cos@q1D + a6 Cos@q6DL Dt@a1, tD Sin@q1D + Sin@a1D Sin@q1D  
H- Cos@q1D Dt@a1, tD + Cos@q6D Dt@a6, tD + a1 Dt@q1, tD Sin@q1D - a6 Dt@q6, tD Sin@q6DL,  
Cos@q2D H- a2 Cos@q2D + a6 Cos@q6DL Dt@q2, tD Sin@a2D +  
Cos@a2D H- a2 Cos@q2D + a6 Cos@q6DL Dt@a2, tD Sin@q2D + Sin@a2D Sin@q2D  
H- Cos@q2D Dt@a2, tD + Cos@q6D Dt@a6, tD + a2 Dt@q2, tD Sin@q2D - a6 Dt@q6, tD Sin@q6DL,  
Cos@q3D H- a3 Cos@q3D + a6 Cos@q6DL Dt@q3, tD Sin@a3D +  
Cos@a3D H- a3 Cos@q3D + a6 Cos@q6DL Dt@a3, tD Sin@q3D + Sin@a3D Sin@q3D  
H- Cos@q3D Dt@a3, tD + Cos@q6D Dt@a6, tD + a3 Dt@q3, tD Sin@q3D - a6 Dt@q6, tD Sin@q6DL,  
Cos@q4D H- a4 Cos@q4D + a6 Cos@q6DL Dt@q4, tD Sin@a4D +  
Cos@a4D H- a4 Cos@q4D + a6 Cos@q6DL Dt@a4, tD Sin@q4D + Sin@a4D Sin@q4D  
H- Cos@q4D Dt@a4, tD + Cos@q6D Dt@a6, tD + a4 Dt@q4, tD Sin@q4D - a6 Dt@q6, tD Sin@q6DL,  
Cos@q5D H- a5 Cos@q5D + a6 Cos@q6DL Dt@q5, tD Sin@a5D +  
Cos@a5D H- a5 Cos@q5D + a6 Cos@q6DL Dt@a5, tD Sin@q5D + Sin@a5D Sin@q5D  
H- Cos@q5D Dt@a5, tD + Cos@q6D Dt@a6, tD + a5 Dt@q5, tD Sin@q5D - a6 Dt@q6, tD Sin@q6DL,  
Cos@q6D H- a5 Cos@q5D + a6 Cos@q6DL Dt@q6, tD Sin@a6D +  
Cos@a6D H- a5 Cos@q5D + a6 Cos@q6DL Dt@a6, tD Sin@q6D + Sin@a6D Sin@q6D  
H- Cos@q5D Dt@a5, tD + Cos@q6D Dt@a6, tD + a5 Dt@q5, tD Sin@q5D - a6 Dt@q6, tD Sin@q6DL<,  
8- Cos@a1D Cos@q1D Dt@a1, tD H- a1 Sin@q1D + a6 Sin@q6DL +

```

Dt@q1, tD Sin@a1D Sin@q1D H- a1 Sin@q1D + a6 Sin@q6DL - Cos@q1D Sin@a1D
H- a1 Cos@q1D Dt@q1, tD + a6 Cos@q6D Dt@q6, tD - Dt@a1, tD Sin@q1D + Dt@a6, tD Sin@q6DL,
- Cos@a2D Cos@q2D Dt@a2, tD H- a2 Sin@q2D + a6 Sin@q6DL +
Dt@q2, tD Sin@a2D Sin@q2D H- a2 Sin@q2D + a6 Sin@q6DL - Cos@q2D Sin@a2D
H- a2 Cos@q2D Dt@q2, tD + a6 Cos@q6D Dt@q6, tD - Dt@a2, tD Sin@q2D + Dt@a6, tD Sin@q6DL,
- Cos@a3D Cos@q3D Dt@a3, tD H- a3 Sin@q3D + a6 Sin@q6DL +
Dt@q3, tD Sin@a3D Sin@q3D H- a3 Sin@q3D + a6 Sin@q6DL - Cos@q3D Sin@a3D
H- a3 Cos@q3D Dt@q3, tD + a6 Cos@q6D Dt@q6, tD - Dt@a3, tD Sin@q3D + Dt@a6, tD Sin@q6DL,
- Cos@a4D Cos@q4D Dt@a4, tD H- a4 Sin@q4D + a6 Sin@q6DL +
Dt@q4, tD Sin@a4D Sin@q4D H- a4 Sin@q4D + a6 Sin@q6DL - Cos@q4D Sin@a4D
H- a4 Cos@q4D Dt@q4, tD + a6 Cos@q6D Dt@q6, tD - Dt@a4, tD Sin@q4D + Dt@a6, tD Sin@q6DL,
- Cos@a5D Cos@q5D Dt@a5, tD H- a5 Sin@q5D + a6 Sin@q6DL +
Dt@q5, tD Sin@a5D Sin@q5D H- a5 Sin@q5D + a6 Sin@q6DL - Cos@q5D Sin@a5D
H- a5 Cos@q5D Dt@q5, tD + a6 Cos@q6D Dt@q6, tD - Dt@a5, tD Sin@q5D + Dt@a6, tD Sin@q6DL,
- Cos@a6D Cos@q6D Dt@a6, tD H- a5 Sin@q5D + a6 Sin@q6DL +
Dt@q6, tD Sin@a6D Sin@q6D H- a5 Sin@q5D + a6 Sin@q6DL - Cos@q6D Sin@a6D
H- a5 Cos@q5D Dt@q5, tD + a6 Cos@q6D Dt@q6, tD - Dt@a5, tD Sin@q5D + Dt@a6, tD Sin@q6DL<,
8Cos@a1D H- Dt@d1, tD + Dt@d6, tDL - H- d1 + d6L Dt@a1, tD Sin@a1D,
Cos@a2D H- Dt@d2, tD + Dt@d6, tDL - H- d2 + d6L Dt@a2, tD Sin@a2D,
Cos@a3D H- Dt@d3, tD + Dt@d6, tDL - H- d3 + d6L Dt@a3, tD Sin@a3D,
Cos@a4D H- Dt@d4, tD + Dt@d6, tDL - H- d4 + d6L Dt@a4, tD Sin@a4D,
Cos@a5D H- Dt@d5, tD + Dt@d6, tDL - H- d5 + d6L Dt@a5, tD Sin@a5D,
Cos@a6D H- Dt@d5, tD + Dt@d6, tDL - H- d5 + d6L Dt@a6, tD Sin@a6D<,
8Cos@q1D Dt@q1, tD Sin@a1D + Cos@a1D Dt@a1, tD Sin@q1D,
Cos@q2D Dt@q2, tD Sin@a2D + Cos@a2D Dt@a2, tD Sin@q2D,
Cos@q3D Dt@q3, tD Sin@a3D + Cos@a3D Dt@a3, tD Sin@q3D,
Cos@q4D Dt@q4, tD Sin@a4D + Cos@a4D Dt@a4, tD Sin@q4D,
Cos@q5D Dt@q5, tD Sin@a5D + Cos@a5D Dt@a5, tD Sin@q5D,
Cos@q6D Dt@q6, tD Sin@a6D + Cos@a6D Dt@a6, tD Sin@q6D<,
8- Cos@a1D Cos@q1D Dt@a1, tD + Dt@q1, tD Sin@a1D Sin@q1D,
- Cos@a2D Cos@q2D Dt@a2, tD + Dt@q2, tD Sin@a2D Sin@q2D,
- Cos@a3D Cos@q3D Dt@a3, tD + Dt@q3, tD Sin@a3D Sin@q3D,
- Cos@a4D Cos@q4D Dt@a4, tD + Dt@q4, tD Sin@a4D Sin@q4D,
- Cos@a5D Cos@q5D Dt@a5, tD + Dt@q5, tD Sin@a5D Sin@q5D,
- Cos@a6D Cos@q6D Dt@a6, tD + Dt@q6, tD Sin@a6D Sin@q6D<,
8- Dt@a1, tD Sin@a1D, - Dt@a2, tD Sin@a2D, - Dt@a3, tD Sin@a3D,
- Dt@a4, tD Sin@a4D, - Dt@a4, tD Sin@a4D, - Dt@a6, tD Sin@a6D<<

```

```
In[3]:= Jinv = Inverse@JD
```

```

Out[3]= 88H- a2 d5 Cos@a4D Cos@a6D Cos@q2D Cos@q4D Sin@a2D Sin@a3D Sin@a4D Sin@q2D Sin@q3D +
a2 d6 Cos@a4D Cos@a6D Cos@q2D Cos@q4D Sin@a2D Sin@a3D Sin@a4D Sin@q2D Sin@q3D +
a2 d5 Cos@a5D Cos@a6D Cos@q2D Cos@q4D Sin@a2D Sin@a3D Sin@a4D Sin@q2D Sin@q3D -
a2 d6 Cos@a5D Cos@a6D Cos@q2D Cos@q4D Sin@a2D Sin@a3D Sin@a4D Sin@q2D Sin@q3D +
a3 d5 Cos@a4D Cos@a6D Cos@q3D Cos@q4D Sin@a2D Sin@a3D Sin@a4D Sin@q2D Sin@q3D -
a3 d6 Cos@a4D Cos@a6D Cos@q3D Cos@q4D Sin@a2D Sin@a3D Sin@a4D Sin@q2D Sin@q3D -
a3 d5 Cos@a5D Cos@a6D Cos@q3D Cos@q4D Sin@a2D Sin@a3D Sin@a4D Sin@q2D Sin@q3D +

```

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \\
& \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \\
& \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \\
& \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d3 \cos@a1D \cos@a3D \\
& \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \\
& \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \\
& \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \\
& \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d4 \cos@a3D \cos@a4D \\
& \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D
\end{aligned}$$



[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_4 a_5 d_5 \cos a_1 \cos a_5 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_4 a_5 d_6 \cos a_1 \cos a_5 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_3 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_4 \sin q_6 - a_3 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_5^2 \sin a_3 \\
& \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_1 \cos a_1 \cos a_2 \\
& \cos q_4 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_4 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_4 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_1 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 - a_5^2 d_2 \cos a_2 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_3 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 - a_1 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_3 \cos q_4 \\
& \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_4 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_2 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_2 a_5 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 + a_5^2 d_1 \cos a_1 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_1 \cos a_4 \cos q_3 \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 + a_2 a_5 d_1 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \\
& \cos q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_1 \cos a_1 \cos a_3 \cos q_4 \\
& \cos q_5^2 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_4 \cos q_5^2 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_3 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3
\end{aligned}$$

$$\begin{aligned}
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 + \\
& a_3 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_5 \sin q_6 + a_3 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 - \\
& a_3 a_5 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5 \sin q_6 - a_5^2 d_1 \cos a_1 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_5 \sin q_6 - a_3 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \\
& \cos q_5 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 + \\
& a_3 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \cos q_5 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5 \sin q_6 + a_5^2 d_1 \cos a_1 \cos a_2 \cos q_4 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 - \\
& a_5^2 d_2 \cos a_1 \cos a_2 \cos q_4 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_5 \sin q_6 + a_4 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 - \\
& a_4 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5 \sin q_6 - a_5^2 d_2 \cos a_2 \cos a_3 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 + \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_4 \sin q_5 \sin q_6 - a_4 a_5 d_1 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \\
& \cos q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 + \\
& a_4 a_5 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5 \sin q_6 + a_5^2 d_1 \cos a_1 \cos a_3 \cos q_2 \\
& \cos q_5^2 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 - \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_5^2 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_4 \sin q_5 \sin q_6 + a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \\
& \cos q_5 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 - \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \cos q_5 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5 \sin q_6 - a_5^2 d_1 \cos a_1 \cos a_2 \cos q_3 \cos q_5^2 \\
& \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_1 \cos a_2 \\
& \cos q_3 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6, \\
& H- a_2 d_5 \cos a_4 \cos a_6 \cos q_2 \cos q_4 \sin a_2 \sin a_3 \sin a_4 \sin q_2 \sin q_3 + \\
& a_2 d_6 \cos a_4 \cos a_6 \cos q_2 \cos q_4 \sin a_2 \sin a_3 \sin a_4 \sin q_2 \sin q_3 + \\
& a_2 d_5 \cos a_5 \cos a_6 \cos q_2 \cos q_4 \sin a_2 \sin a_3 \sin a_4 \sin q_2 \sin q_3 - \\
& a_2 d_6 \cos a_5 \cos a_6 \cos q_2 \cos q_4 \sin a_2 \sin a_3 \sin a_4 \sin q_2 \sin q_3 + \\
& a_3 d_5 \cos a_4 \cos a_6 \cos q_3 \cos q_4 \sin a_2 \sin a_3 \sin a_4 \sin q_2 \sin q_3 - \\
& a_3 d_6 \cos a_4 \cos a_6 \cos q_3 \cos q_4 \sin a_2 \sin a_3 \sin a_4 \sin q_2 \sin q_3 - \\
& a_3 d_5 \cos a_5 \cos a_6 \cos q_3 \cos q_4 \sin a_2 \sin a_3 \sin a_4 \sin q_2 \sin q_3 + \\
& a_3 d_6 \cos a_5 \cos a_6 \cos q_3 \cos q_4 \sin a_2 \sin a_3 \sin a_4 \sin q_2 \sin q_3 - \\
& a_2 d_4 \cos a_4 \cos a_6 \cos q_2 \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin q_2 \sin q_3 + \\
& a_2 d_5 \cos a_4 \cos a_6 \cos q_2 \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin q_2 \sin q_3 + \\
& a_3 d_4 \cos a_4 \cos a_6 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin q_2 \sin q_3 -
\end{aligned}$$

[illegible]



[illegible]

[illegible]

$$\begin{aligned}
& a5 d6 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \sin@a3D \sin@a4D \sin@a6D \sin@q4D \sin@q6D + \\
& a5 d5 \cos@a2D \cos@a5D \cos@q3D \cos@q5D \sin@a3D \sin@a4D \sin@a6D \sin@q4D \sin@q6D - \\
& a5 d6 \cos@a2D \cos@a5D \cos@q3D \cos@q5D \sin@a3D \sin@a4D \sin@a6D \sin@q4D \sin@q6D - \\
& a4 d2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q6D + \\
& a4 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q6D + \\
& a5 d2 \cos@a2D \cos@a3D \cos@q5D^2 \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q6D - \\
& a5 d3 \cos@a2D \cos@a3D \cos@q5D^2 \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q6DL'
\end{aligned}$$

$$\begin{aligned}
H- & a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d5 \cos@a4D \cos@a5D \\
& \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q5D - a3 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a3 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D + a3 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D
\end{aligned}$$

[illegible]

[illegible]

[illegible]



$$\begin{aligned} & \text{Cos@a1D Cos@q6D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q5D -} \\ & \text{a4 a5 d2 Cos@a1D Cos@a2D Cos@q4D Cos@q5D Cos@q6D Sin@a3D Sin@a4D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q3D Sin@q4D Sin@q5D + a1 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\ & \quad \text{Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D^2 -} \\ & \text{a1 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q1D Sin@q5D^2 - a5^2 d3 Cos@a3D Cos@a4D Cos@q2D Cos@q5D Cos@q6D} \\ & \quad \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D^2 + a5^2 d4 Cos@a3D Cos@a4D} \\ & \quad \text{Cos@q2D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D^2} \\ & \text{a1 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q1D Sin@q5D^2 + a1 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D} \\ & \quad \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D^2 + a5^2 d2 Cos@a2D Cos@a4D} \\ & \quad \text{Cos@q3D Cos@q5D Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D^2 -} \\ & \text{a5^2 d4 Cos@a2D Cos@a4D Cos@q3D Cos@q5D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q1D Sin@q5D^2 + a1 a5 d2 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q6D} \\ & \quad \text{Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D^2 - a1 a5 d3 Cos@a2D Cos@a3D} \\ & \quad \text{Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D^2 -} \\ & \text{a5^2 d2 Cos@a2D Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q1D Sin@q5D^2 + a5^2 d3 Cos@a2D Cos@a3D Cos@q4D Cos@q5D Cos@q6D} \\ & \quad \text{Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D^2 - a2 a5 d3 Cos@a3D Cos@a4D} \\ & \quad \text{Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D^2 +} \\ & \text{a2 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q2D Sin@q5D^2 + a5^2 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q5D Cos@q6D} \\ & \quad \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D^2 - a5^2 d4 Cos@a3D Cos@a4D} \\ & \quad \text{Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D^2 +} \\ & \text{a2 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q2D Sin@q5D^2 - a2 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D} \\ & \quad \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D^2 - a5^2 d1 Cos@a1D Cos@a4D} \\ & \quad \text{Cos@q3D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D^2 +} \\ & \text{a5^2 d4 Cos@a1D Cos@a4D Cos@q3D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q2D Sin@q5D^2 - a2 a5 d1 Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q6D} \\ & \quad \text{Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D^2 + a2 a5 d3 Cos@a1D Cos@a3D} \\ & \quad \text{Cos@q2D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D^2 +} \\ & \text{a5^2 d1 Cos@a1D Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a2D Sin@a4D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q2D Sin@q5D^2 - a5^2 d3 Cos@a1D Cos@a3D Cos@q4D Cos@q5D Cos@q6D} \\ & \quad \text{Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D^2 + a3 a5 d2 Cos@a2D Cos@a4D} \\ & \quad \text{Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D^2 -} \\ & \text{a3 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q3D Sin@q5D^2 - a5^2 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q5D Cos@q6D} \\ & \quad \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D^2 + a5^2 d4 Cos@a2D Cos@a4D} \\ & \quad \text{Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D^2 -} \\ & \text{a3 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q3D Sin@q5D^2 + a3 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D} \\ & \quad \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D^2 + a5^2 d1 Cos@a1D Cos@a4D} \\ & \quad \text{Cos@q2D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D^2 -} \\ & \text{a5^2 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\ & \quad \text{Sin@a6D Sin@q3D Sin@q5D^2 + a3 a5 d1 Cos@a1D Cos@a2D Cos@q3D Cos@q4D Cos@q6D} \end{aligned}$$

$$\begin{aligned}
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \\
& \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \\
& \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d3 \cos@a2D \cos@a3D \\
& \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \\
& \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \\
& \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \\
& \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D -
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& a^5 a^6 d_6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a^3 a^5 d_5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a^3 a^5 d_6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a^4 a^5 d_1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a^4 a^5 d_6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a^4 a^5 d_5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a^4 a^5 d_6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a^3 a^5 d_1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a^3 a^5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a^4 a^5 d_1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a^4 a^5 d_2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D - a^1 a^5 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^1 a^5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a^5 a^2 d_3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^5 a^2 d_4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a^1 a^5 d_2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^1 a^5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a^5 a^2 d_2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^5 a^2 d_4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D - a^1 a^5 d_2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^1 a^5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a^5 a^2 d_2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^5 a^2 d_3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a^2 a^5 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 a^2 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 a^2 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^2 a^5 d_1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^2 a^5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a^5 a^2 d_1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^5 a^2 d_4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D
\end{aligned}$$

$$\begin{aligned}
& \sin@q2D \sin@q5D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D, \\
& H- a2 a5 \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \\
& \sin@q3D \sin@q5D + a3 a5 \cos@a4D \cos@q3D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \\
& \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q5D + a2 a5 \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q5D -
\end{aligned}$$

$$\begin{aligned}
& \text{a3 a5 Cos@a4D Cos@q5D Sin@a2D Sin@a3D Sin@a5D Sin@a6D} \\
& \quad \text{Sin@q2D Sin@q3D Sin@q5D} + \text{a2 a5 Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D} \\
& \quad \text{Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} - \text{a4 a5 Cos@a4D Cos@q3D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} - \\
& \text{a2 a5 Cos@a3D Cos@q2D Cos@q5D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D} \\
& \quad \text{Sin@q2D Sin@q4D Sin@q5D} + \text{a4 a5 Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a2D} \\
& \quad \text{Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} - \text{a3 a5 Cos@a4D Cos@q2D} \\
& \quad \text{Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D} + \\
& \text{a4 a5 Cos@a4D Cos@q2D Cos@q4D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D} \\
& \quad \text{Sin@q3D Sin@q4D Sin@q5D} + \text{a3 a5 Cos@a2D Cos@q3D Cos@q5D Cos@q6D Sin@a3D} \\
& \quad \text{Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q5D} - \text{a4 a5 Cos@a2D Cos@q4D} \\
& \quad \text{Cos@q5D Cos@q6D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q5D} - \\
& \text{a2 a5 Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \\
& \text{a5}^2 \text{ Cos@a4D Cos@q3D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \\
& \text{a2 a5 Cos@a3D Cos@q2D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 - \\
& \text{a5}^2 \text{ Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \\
& \text{a3 a5 Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a5}^2 \text{ Cos@a4D Cos@q2D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a3 a5 Cos@a2D Cos@q3D Cos@q4D Cos@q6D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 + \\
& \text{a5}^2 \text{ Cos@a2D Cos@q4D Cos@q5D Cos@q6D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a4 a5 Cos@a3D Cos@q2D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D}^2 + \\
& \text{a5}^2 \text{ Cos@a3D Cos@q2D Cos@q5D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D}^2 + \\
& \text{a4 a5 Cos@a2D Cos@q3D Cos@q4D Cos@q6D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D}^2 - \\
& \text{a5}^2 \text{ Cos@a2D Cos@q3D Cos@q5D Cos@q6D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D}^2 + \\
& \text{a2 a5 Cos@a4D Cos@q2D Cos@q4D Cos@q5D Sin@a2D Sin@a3D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q2D Sin@q3D Sin@q6D} - \text{a3 a5 Cos@a4D Cos@q3D Cos@q4D} \\
& \quad \text{Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q3D Sin@q6D} - \\
& \text{a2 a5 Cos@a4D Cos@q2D Cos@q5D}^2 \text{ Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q3D Sin@q6D} + \\
& \text{a3 a5 Cos@a4D Cos@q3D Cos@q5D}^2 \text{ Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q3D Sin@q6D} - \\
& \text{a2 a5 Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \text{a4 a5 Cos@a4D Cos@q3D Cos@q4D} \\
& \quad \text{Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \\
& \text{a2 a5 Cos@a3D Cos@q2D Cos@q5D}^2 \text{ Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} - \\
& \text{a4 a5 Cos@a3D Cos@q4D Cos@q5D}^2 \text{ Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \\
& \text{a3 a5 Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q3D Sin@q4D Sin@q6D} - \text{a4 a5 Cos@a4D Cos@q2D Cos@q4D} \\
& \quad \text{Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q6D} - \\
& \text{a3 a5 Cos@a2D Cos@q3D Cos@q5D}^2 \text{ Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q6D} + \\
& \text{a4 a5 Cos@a2D Cos@q4D Cos@q5D}^2 \text{ Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q6D} + \\
& \text{a2 a5 Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D} \\
& \quad \text{Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} - \\
& \text{a5}^2 \text{ Cos@a4D Cos@q3D Cos@q5D}^2 \text{ Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} - \\
& \text{a2 a5 Cos@a3D Cos@q2D Cos@q4D Cos@q5D Sin@a2D} \\
& \quad \text{Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} + \\
& \text{a5}^2 \text{ Cos@a3D Cos@q4D Cos@q5D}^2 \text{ Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} - \\
& \text{a3 a5 Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D}
\end{aligned}$$



$$\begin{aligned}
& \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \\
& \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a4 a5 \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \\
& \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \\
& \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D \\
H- & a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d5 \cos@a4D \cos@a5D \\
& \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d3 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \\
& \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + a5^2 d4 \cos@a3D \cos@a4D \\
& \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \\
& \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a4D \\
& \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \\
& \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + a5^2 d3 \cos@a2D \cos@a3D \\
& \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \\
& \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d3 \cos@a3D \cos@a4D \\
& \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \\
& \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d4 \cos@a1D \cos@a4D \\
& \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \\
& \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \\
& \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \\
& \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d4 \cos@a2D \cos@a4D \\
& \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \\
& \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \\
& \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D
\end{aligned}$$

[illegible]

[illegible]



[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a3 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a3 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a5^2 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D - a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d3 \cos@a3D \cos@a4D \cos@q1D
\end{aligned}$$

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]



$$\begin{aligned}
& \text{a5 a6 d2 Cos@a2D Cos@a3D Cos@q4D Cos@q5D Sin@a4D Sin@a5D Sin@a6D Sin@q5D Sin@q6D +} \\
& \text{a5 a6 d3 Cos@a2D Cos@a3D Cos@q4D Cos@q5D Cos@q6D} \\
& \quad \text{Sin@a4D Sin@a5D Sin@a6D Sin@q5D Sin@q6DL ' } \\
\text{H-} & \text{a1 a5 d4 Cos@a4D}^2 \text{ Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D} \\
& \quad \text{Sin@q1D Sin@q2D Sin@q5D + a1 a5 d6 Cos@a4D}^2 \text{ Cos@q1D Cos@q3D Cos@q6D Sin@a1D} \\
& \quad \text{Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a1 a5 d5 Cos@a4D Cos@a5D} \\
& \quad \text{Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a1 a5 d6 Cos@a4D Cos@a5D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a2 a5 d4 Cos@a4D}^2 \text{ Cos@q2D Cos@q3D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a2 a5 d6 Cos@a4D}^2 \text{ Cos@q2D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D} \\
& \quad \text{Sin@q1D Sin@q2D Sin@q5D - a2 a5 d5 Cos@a4D Cos@a5D Cos@q2D Cos@q3D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a2 a5 d6 Cos@a4D Cos@a5D Cos@q2D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a1 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a1 a5 d6 Cos@a3D Cos@a4D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D - a1 a5 d5 Cos@a3D Cos@a5D Cos@q1D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a1 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D - a2 a5 d3 Cos@a3D Cos@a4D Cos@q2D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a2 a5 d6 Cos@a3D Cos@a4D Cos@q2D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a2 a5 d5 Cos@a3D Cos@a5D Cos@q2D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a2 a5 d6 Cos@a3D Cos@a5D Cos@q2D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D - a1 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\
& \quad \text{Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a1 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a2 a5 d3 Cos@a3D Cos@a4D Cos@q2D} \\
& \quad \text{Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a2 a5 d4 Cos@a3D Cos@a4D Cos@q2D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a1 a5 d4 Cos@a4D}^2 \text{ Cos@q1D Cos@q2D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q5D -} \\
& \text{a1 a5 d6 Cos@a4D}^2 \text{ Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D} \\
& \quad \text{Sin@q1D Sin@q3D Sin@q5D - a1 a5 d5 Cos@a4D Cos@a5D Cos@q1D Cos@q2D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q5D +} \\
& \text{a1 a5 d6 Cos@a4D Cos@a5D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a3D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q3D Sin@q5D - a3 a5 d4 Cos@a4D}^2 \text{ Cos@q2D Cos@q3D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q5D +} \\
& \text{a3 a5 d6 Cos@a4D}^2 \text{ Cos@q2D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D} \\
& \quad \text{Sin@q1D Sin@q3D Sin@q5D + a3 a5 d5 Cos@a4D Cos@a5D Cos@q2D Cos@q3D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q5D -} \\
& \text{a3 a5 d6 Cos@a4D Cos@a5D Cos@q2D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q3D Sin@q5D - a1 a5 d2 Cos@a2D Cos@a4D Cos@q1D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q3D Sin@q5D +}
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \text{a1 a5 d4 Cos@a3D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q5D}^2 - \text{a5}^2 \text{d3 Cos@a3D Cos@a4D Cos@q2D Cos@q5D Cos@q6D} \\
& \quad \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 + \text{a5}^2 \text{d4 Cos@a3D Cos@a4D} \\
& \quad \text{Cos@q2D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 - \\
& \text{a1 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q5D}^2 + \text{a1 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D} \\
& \quad \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 + \text{a5}^2 \text{d2 Cos@a2D Cos@a4D} \\
& \quad \text{Cos@q3D Cos@q5D Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 \\
& \text{a5}^2 \text{d4 Cos@a2D Cos@a4D Cos@q3D Cos@q5D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q5D}^2 + \text{a1 a5 d2 Cos@a2D Cos@a3D Cos@q1D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 - \\
& \text{a1 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q5D}^2 - \text{a5}^2 \text{d2 Cos@a2D Cos@a3D Cos@q4D Cos@q5D Cos@q6D} \\
& \quad \text{Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 + \text{a5}^2 \text{d3 Cos@a2D Cos@a3D} \\
& \quad \text{Cos@q4D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 - \\
& \text{a2 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a2 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D} \\
& \quad \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a5}^2 \text{d3 Cos@a3D Cos@a4D} \\
& \quad \text{Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 - \\
& \text{a5}^2 \text{d4 Cos@a3D Cos@a4D Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a2 a5 d1 Cos@a1D Cos@a4D Cos@q2D} \\
& \quad \text{Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 - \\
& \text{a2 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q2D Sin@q5D}^2 - \text{a5}^2 \text{d1 Cos@a1D Cos@a4D Cos@q3D Cos@q5D Cos@q6D} \\
& \quad \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a5}^2 \text{d4 Cos@a1D Cos@a4D} \\
& \quad \text{Cos@q3D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 - \\
& \text{a2 a5 d1 Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a2 a5 d3 Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q6D} \\
& \quad \text{Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a5}^2 \text{d1 Cos@a1D Cos@a3D} \\
& \quad \text{Cos@q4D Cos@q5D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 - \\
& \text{a5}^2 \text{d3 Cos@a1D Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a2D Sin@a4D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a3 a5 d2 Cos@a2D Cos@a4D Cos@q1D} \\
& \quad \text{Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a3 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q3D Sin@q5D}^2 - \text{a5}^2 \text{d2 Cos@a2D Cos@a4D Cos@q1D Cos@q5D Cos@q6D} \\
& \quad \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 + \text{a5}^2 \text{d4 Cos@a2D Cos@a4D} \\
& \quad \text{Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a3 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q3D Sin@q5D}^2 + \text{a3 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D} \\
& \quad \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 + \text{a5}^2 \text{d1 Cos@a1D Cos@a4D} \\
& \quad \text{Cos@q2D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a5}^2 \text{d4 Cos@a1D Cos@a4D Cos@q2D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q3D Sin@q5D}^2 + \text{a3 a5 d1 Cos@a1D Cos@a2D Cos@q3D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a3 a5 d2 Cos@a1D Cos@a2D Cos@q3D Cos@q4D Cos@q6D Sin@a3D Sin@a4D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q3D Sin@q5D}^2 - \text{a5}^2 \text{d1 Cos@a1D Cos@a2D Cos@q4D Cos@q5D Cos@q6D}
\end{aligned}$$

$$\begin{aligned}
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \\
& \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \\
& \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \\
& \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d3 \cos@a1D \cos@a3D \\
& \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D
\end{aligned}$$

[illegible]

[illegible]



[illegible]

$$\begin{aligned}
& \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_3 a_5 d_6 \cos a_1 \cos a_5 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_4 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_4 a_5 d_6 \cos a_1 \cos a_4 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_5 \cos a_1 \cos a_5 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_6 \cos a_1 \cos a_5 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_3 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_3 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_4 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_4 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_4 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_1 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 - a_5^2 d_2 \cos a_2 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_3 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 - a_1 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_3 \cos q_4 \\
& \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_4 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_2 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_2 a_5 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 + a_5^2 d_1 \cos a_1 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_1 \cos a_4 \cos q_3 \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 + a_2 a_5 d_1 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \\
& \cos q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 -
\end{aligned}$$

$$\begin{aligned}
& a_2 a_5 d_3 \cos@a_1D \cos@a_3D \cos@q_2D \cos@q_4D \cos@q_5D \sin@a_2D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D \sin@q_6D - a_5^2 d_1 \cos@a_1D \cos@a_3D \cos@q_4D \\
& \cos@q_5D^2 \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D \sin@q_6D + \\
& a_5^2 d_3 \cos@a_1D \cos@a_3D \cos@q_4D \cos@q_5D^2 \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \\
& \sin@q_2D \sin@q_5D \sin@q_6D - a_3 a_5 d_2 \cos@a_2D \cos@a_4D \cos@q_1D \cos@q_3D \\
& \cos@q_5D \sin@a_1D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D + \\
& a_3 a_5 d_4 \cos@a_2D \cos@a_4D \cos@q_1D \cos@q_3D \cos@q_5D \sin@a_1D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D + a_5^2 d_2 \cos@a_2D \cos@a_4D \cos@q_1D \\
& \cos@q_5D^2 \sin@a_1D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D - \\
& a_5^2 d_4 \cos@a_2D \cos@a_4D \cos@q_1D \cos@q_5D^2 \sin@a_1D \sin@a_3D \sin@a_5D \sin@a_6D \\
& \sin@q_3D \sin@q_5D \sin@q_6D + a_3 a_5 d_1 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_3D \\
& \cos@q_5D \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D - \\
& a_3 a_5 d_4 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_3D \cos@q_5D \sin@a_2D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D - a_5^2 d_1 \cos@a_1D \cos@a_4D \cos@q_2D \\
& \cos@q_5D^2 \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D + \\
& a_5^2 d_4 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_5D^2 \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \\
& \sin@q_3D \sin@q_5D \sin@q_6D - a_3 a_5 d_1 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_4D \\
& \cos@q_5D \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D + \\
& a_3 a_5 d_2 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_4D \cos@q_5D \sin@a_3D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D + a_5^2 d_1 \cos@a_1D \cos@a_2D \cos@q_4D \\
& \cos@q_5D^2 \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D - \\
& a_5^2 d_2 \cos@a_1D \cos@a_2D \cos@q_4D \cos@q_5D^2 \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \\
& \sin@q_3D \sin@q_5D \sin@q_6D + a_4 a_5 d_2 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_4D \\
& \cos@q_5D \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - \\
& a_4 a_5 d_3 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_4D \cos@q_5D \sin@a_1D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - a_5^2 d_2 \cos@a_2D \cos@a_3D \cos@q_1D \\
& \cos@q_5D^2 \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D + \\
& a_5^2 d_3 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_5D^2 \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \\
& \sin@q_4D \sin@q_5D \sin@q_6D - a_4 a_5 d_1 \cos@a_1D \cos@a_3D \cos@q_2D \cos@q_4D \\
& \cos@q_5D \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D + \\
& a_4 a_5 d_3 \cos@a_1D \cos@a_3D \cos@q_2D \cos@q_4D \cos@q_5D \sin@a_2D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D + a_5^2 d_1 \cos@a_1D \cos@a_3D \cos@q_2D \\
& \cos@q_5D^2 \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - \\
& a_5^2 d_3 \cos@a_1D \cos@a_3D \cos@q_2D \cos@q_5D^2 \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \\
& \sin@q_4D \sin@q_5D \sin@q_6D + a_4 a_5 d_1 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_4D \\
& \cos@q_5D \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - \\
& a_4 a_5 d_2 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_4D \cos@q_5D \sin@a_3D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - a_5^2 d_1 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_5D^2 \\
& \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D + a_5^2 d_2 \cos@a_1D \cos@a_2D \\
& \cos@q_3D \cos@q_5D^2 \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D, \\
& \text{Ha2 } a_5 d_4 \cos@a_4D^2 \cos@q_2D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_2D \sin@q_3D \sin@q_5D - \\
& a_2 a_5 d_6 \cos@a_4D^2 \cos@q_2D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_2D \sin@q_3D \sin@q_5D - \\
& a_2 a_5 d_5 \cos@a_4D \cos@a_5D \cos@q_2D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_2D \sin@q_3D \sin@q_5D + \\
& a_2 a_5 d_6 \cos@a_4D \cos@a_5D \cos@q_2D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_2D \sin@q_3D \sin@q_5D - \\
& a_3 a_5 d_4 \cos@a_4D^2 \cos@q_3D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_2D \sin@q_3D \sin@q_5D + \\
& a_3 a_5 d_6 \cos@a_4D^2 \cos@q_3D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_2D \sin@q_3D \sin@q_5D +
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \text{a1 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 - \text{a5}^2 \text{d2 Cos@a2D Cos@a3D Cos@q4D Cos@q5D Cos@q6D} \\
& \text{Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 + \text{a5}^2 \text{d3 Cos@a2D Cos@a3D} \\
& \text{Cos@q4D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 - \\
& \text{a2 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a2 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D} \\
& \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a5}^2 \text{d3 Cos@a3D Cos@a4D} \\
& \text{Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 \\
& \text{a5}^2 \text{d4 Cos@a3D Cos@a4D Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a2 a5 d1 Cos@a1D Cos@a4D Cos@q2D} \\
& \text{Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 - \\
& \text{a2 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 - \text{a5}^2 \text{d1 Cos@a1D Cos@a4D Cos@q3D Cos@q5D Cos@q6D} \\
& \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a5}^2 \text{d4 Cos@a1D Cos@a4D} \\
& \text{Cos@q3D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 - \\
& \text{a2 a5 d1 Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a2 a5 d3 Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q6D} \\
& \text{Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a5}^2 \text{d1 Cos@a1D Cos@a3D} \\
& \text{Cos@q4D Cos@q5D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 - \\
& \text{a5}^2 \text{d3 Cos@a1D Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a2D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a3 a5 d2 Cos@a2D Cos@a4D Cos@q1D} \\
& \text{Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a3 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q3D Sin@q5D}^2 - \text{a5}^2 \text{d2 Cos@a2D Cos@a4D Cos@q1D Cos@q5D Cos@q6D} \\
& \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 + \text{a5}^2 \text{d4 Cos@a2D Cos@a4D} \\
& \text{Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a3 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q3D Sin@q5D}^2 + \text{a3 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D} \\
& \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 + \text{a5}^2 \text{d1 Cos@a1D Cos@a4D} \\
& \text{Cos@q2D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a5}^2 \text{d4 Cos@a1D Cos@a4D Cos@q2D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q3D Sin@q5D}^2 + \text{a3 a5 d1 Cos@a1D Cos@a2D Cos@q3D} \\
& \text{Cos@q4D Cos@q6D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a3 a5 d2 Cos@a1D Cos@a2D Cos@q3D Cos@q4D Cos@q6D Sin@a3D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q3D Sin@q5D}^2 - \text{a5}^2 \text{d1 Cos@a1D Cos@a2D Cos@q4D Cos@q5D Cos@q6D} \\
& \text{Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 + \text{a5}^2 \text{d2 Cos@a1D Cos@a2D} \\
& \text{Cos@q4D Cos@q5D Cos@q6D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& \text{a4 a5 d2 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q4D Sin@q5D}^2 + \text{a4 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q6D} \\
& \text{Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D}^2 + \text{a5}^2 \text{d2 Cos@a2D Cos@a3D} \\
& \text{Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D}^2 - \\
& \text{a5}^2 \text{d3 Cos@a2D Cos@a3D Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q4D Sin@q5D}^2 + \text{a4 a5 d1 Cos@a1D Cos@a3D Cos@q2D} \\
& \text{Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D}^2 - \\
& \text{a4 a5 d3 Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q4D Sin@q5D}^2 - \text{a5}^2 \text{d1 Cos@a1D Cos@a3D Cos@q2D Cos@q5D Cos@q6D}
\end{aligned}$$

$$\begin{aligned}
& \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d3 \cos@a1D \cos@a3D \\
& \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q6D + a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q6D - \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q6D + a3 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q6D - \\
& a3 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D
\end{aligned}$$

[illegible]

[illegible]



[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a5^2 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D - a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D
\end{aligned}$$

$$\begin{aligned}
& \cos(q_5) \sin(a_2) \sin(a_3) \sin(a_5) \sin(a_6) \sin(q_3) \sin(q_5) \sin(q_6) - \\
& a_3 a_5 d_4 \cos(a_1) \cos(a_4) \cos(q_2) \cos(q_3) \cos(q_5) \sin(a_2) \sin(a_3) \sin(a_5) \\
& \sin(a_6) \sin(q_3) \sin(q_5) \sin(q_6) - a_5^2 d_1 \cos(a_1) \cos(a_4) \cos(q_2) \\
& \cos(q_5)^2 \sin(a_2) \sin(a_3) \sin(a_5) \sin(a_6) \sin(q_3) \sin(q_5) \sin(q_6) + \\
& a_5^2 d_4 \cos(a_1) \cos(a_4) \cos(q_2) \cos(q_5)^2 \sin(a_2) \sin(a_3) \sin(a_5) \sin(a_6) \\
& \sin(q_3) \sin(q_5) \sin(q_6) - a_3 a_5 d_1 \cos(a_1) \cos(a_2) \cos(q_3) \cos(q_4) \\
& \cos(q_5) \sin(a_3) \sin(a_4) \sin(a_5) \sin(a_6) \sin(q_3) \sin(q_5) \sin(q_6) + \\
& a_3 a_5 d_2 \cos(a_1) \cos(a_2) \cos(q_3) \cos(q_4) \cos(q_5) \sin(a_3) \sin(a_4) \sin(a_5) \\
& \sin(a_6) \sin(q_3) \sin(q_5) \sin(q_6) + a_5^2 d_1 \cos(a_1) \cos(a_2) \cos(q_4) \\
& \cos(q_5)^2 \sin(a_3) \sin(a_4) \sin(a_5) \sin(a_6) \sin(q_3) \sin(q_5) \sin(q_6) - \\
& a_5^2 d_2 \cos(a_1) \cos(a_2) \cos(q_4) \cos(q_5)^2 \sin(a_3) \sin(a_4) \sin(a_5) \sin(a_6) \\
& \sin(q_3) \sin(q_5) \sin(q_6) + a_4 a_5 d_2 \cos(a_2) \cos(a_3) \cos(q_1) \cos(q_4) \\
& \cos(q_5) \sin(a_1) \sin(a_4) \sin(a_5) \sin(a_6) \sin(q_4) \sin(q_5) \sin(q_6) - \\
& a_4 a_5 d_3 \cos(a_2) \cos(a_3) \cos(q_1) \cos(q_4) \cos(q_5) \sin(a_1) \sin(a_4) \sin(a_5) \\
& \sin(a_6) \sin(q_4) \sin(q_5) \sin(q_6) - a_5^2 d_2 \cos(a_2) \cos(a_3) \cos(q_1) \\
& \cos(q_5)^2 \sin(a_1) \sin(a_4) \sin(a_5) \sin(a_6) \sin(q_4) \sin(q_5) \sin(q_6) + \\
& a_5^2 d_3 \cos(a_2) \cos(a_3) \cos(q_1) \cos(q_5)^2 \sin(a_1) \sin(a_4) \sin(a_5) \sin(a_6) \\
& \sin(q_4) \sin(q_5) \sin(q_6) - a_4 a_5 d_1 \cos(a_1) \cos(a_3) \cos(q_2) \cos(q_4) \\
& \cos(q_5) \sin(a_2) \sin(a_4) \sin(a_5) \sin(a_6) \sin(q_4) \sin(q_5) \sin(q_6) + \\
& a_4 a_5 d_3 \cos(a_1) \cos(a_3) \cos(q_2) \cos(q_4) \cos(q_5) \sin(a_2) \sin(a_4) \sin(a_5) \\
& \sin(a_6) \sin(q_4) \sin(q_5) \sin(q_6) + a_5^2 d_1 \cos(a_1) \cos(a_3) \cos(q_2) \\
& \cos(q_5)^2 \sin(a_2) \sin(a_4) \sin(a_5) \sin(a_6) \sin(q_4) \sin(q_5) \sin(q_6) - \\
& a_5^2 d_3 \cos(a_1) \cos(a_3) \cos(q_2) \cos(q_5)^2 \sin(a_2) \sin(a_4) \sin(a_5) \sin(a_6) \\
& \sin(q_4) \sin(q_5) \sin(q_6) + a_4 a_5 d_1 \cos(a_1) \cos(a_2) \cos(q_3) \cos(q_4) \\
& \cos(q_5) \sin(a_3) \sin(a_4) \sin(a_5) \sin(a_6) \sin(q_4) \sin(q_5) \sin(q_6) - \\
& a_4 a_5 d_2 \cos(a_1) \cos(a_2) \cos(q_3) \cos(q_4) \cos(q_5) \sin(a_3) \sin(a_4) \sin(a_5) \\
& \sin(a_6) \sin(q_4) \sin(q_5) \sin(q_6) - a_5^2 d_1 \cos(a_1) \cos(a_2) \cos(q_3) \cos(q_5)^2 \\
& \sin(a_3) \sin(a_4) \sin(a_5) \sin(a_6) \sin(q_4) \sin(q_5) \sin(q_6) + a_5^2 d_2 \cos(a_1) \cos(a_2) \\
& \cos(q_3) \cos(q_5)^2 \sin(a_3) \sin(a_4) \sin(a_5) \sin(a_6) \sin(q_4) \sin(q_5) \sin(q_6), \\
& \text{H- } a_2 a_5 d_5 \cos(a_5) \cos(q_2) \cos(q_4) \cos(q_6) \sin(a_2) \sin(a_3) \sin(a_4) \sin(a_6) \\
& \sin(q_2) \sin(q_3) \sin(q_5) + a_2 a_5 d_6 \cos(a_5) \cos(q_2) \cos(q_4) \cos(q_6) \sin(a_2) \\
& \sin(a_3) \sin(a_4) \sin(a_6) \sin(q_2) \sin(q_3) \sin(q_5) + a_3 a_5 d_5 \cos(a_5) \cos(q_3) \\
& \cos(q_4) \cos(q_6) \sin(a_2) \sin(a_3) \sin(a_4) \sin(a_6) \sin(q_2) \sin(q_3) \sin(q_5) - \\
& a_3 a_5 d_6 \cos(a_5) \cos(q_3) \cos(q_4) \cos(q_6) \sin(a_2) \sin(a_3) \sin(a_4) \sin(a_6) \\
& \sin(q_2) \sin(q_3) \sin(q_5) + a_2 a_5 d_4 \cos(a_4) \cos(q_2) \cos(q_5) \cos(q_6) \sin(a_2) \\
& \sin(a_3) \sin(a_5) \sin(a_6) \sin(q_2) \sin(q_3) \sin(q_5) - a_2 a_5 d_6 \cos(a_4) \cos(q_2) \\
& \cos(q_5) \cos(q_6) \sin(a_2) \sin(a_3) \sin(a_5) \sin(a_6) \sin(q_2) \sin(q_3) \sin(q_5) - \\
& a_3 a_5 d_4 \cos(a_4) \cos(q_3) \cos(q_5) \cos(q_6) \sin(a_2) \sin(a_3) \sin(a_5) \sin(a_6) \\
& \sin(q_2) \sin(q_3) \sin(q_5) + a_3 a_5 d_6 \cos(a_4) \cos(q_3) \cos(q_5) \cos(q_6) \sin(a_2) \\
& \sin(a_3) \sin(a_5) \sin(a_6) \sin(q_2) \sin(q_3) \sin(q_5) + a_2 a_5 d_5 \cos(a_5) \cos(q_2) \\
& \cos(q_3) \cos(q_6) \sin(a_2) \sin(a_3) \sin(a_4) \sin(a_6) \sin(q_2) \sin(q_4) \sin(q_5) - \\
& a_2 a_5 d_6 \cos(a_5) \cos(q_2) \cos(q_3) \cos(q_6) \sin(a_2) \sin(a_3) \sin(a_4) \sin(a_6) \\
& \sin(q_2) \sin(q_4) \sin(q_5) - a_4 a_5 d_5 \cos(a_5) \cos(q_3) \cos(q_4) \cos(q_6) \sin(a_2) \\
& \sin(a_3) \sin(a_4) \sin(a_6) \sin(q_2) \sin(q_4) \sin(q_5) + a_4 a_5 d_6 \cos(a_5) \cos(q_3) \\
& \cos(q_4) \cos(q_6) \sin(a_2) \sin(a_3) \sin(a_4) \sin(a_6) \sin(q_2) \sin(q_4) \sin(q_5) - \\
& a_2 a_5 d_3 \cos(a_3) \cos(q_2) \cos(q_5) \cos(q_6) \sin(a_2) \sin(a_4) \sin(a_5) \sin(a_6)
\end{aligned}$$

$$\begin{aligned}
& \sin@q2D \sin@q4D \sin@q5D + a2 a5 d6 \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \\
& \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q5D + a4 a5 d3 \cos@a3D \cos@q4D \\
& \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q5D - \\
& a4 a5 d6 \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q5D - a3 a5 d5 \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \\
& \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a3 a5 d6 \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a4 a5 d5 \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q5D - a4 a5 d6 \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \\
& \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a3 a5 d2 \cos@a2D \cos@q3D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a3 a5 d6 \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q5D - a4 a5 d2 \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a4 a5 d6 \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q5D - a2 a5 d4 \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \\
& \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d6 \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d6 \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d6 \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d6 \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d6 \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d6 \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d6 \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d6 \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d6 \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d6 \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d6 \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d6 \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a2 a5 d5 \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D - a2 a5 d6 \cos@a5D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a3 a5 d5 \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q2D \sin@q3D \sin@q6D + a3 a5 d6 \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \\
& \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - a2 a5 d4 \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q6D + \\
& a2 a5 d6 \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \\
& \sin@q3D \sin@q6D + a3 a5 d4 \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \\
& \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - a3 a5 d6 \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a2 a5 d5 \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q6D + a2 a5 d6 \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \\
& \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d5 \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q6D + a2 a5 d3 \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \\
& \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a2 a5 d6 \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d3 \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \\
& \sin@q4D \sin@q6D + a4 a5 d6 \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \\
& \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a3 a5 d5 \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d6 \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \\
& \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d6 \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d2 \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \\
& \sin@q4D \sin@q6D + a3 a5 d6 \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \\
& \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d2 \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \\
& \sin@q4D \sin@q6D + a2 a5 d4 \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \\
& \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a2 a5 d6 \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d6 \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d3 \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a2 a5 d6 \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a5^2 d6 \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a3 a5 d6 \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d6 \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D +
\end{aligned}$$

$$\begin{aligned}
& a^3 a^5 d^2 \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^3 a^5 d^6 \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5^2 d^2 \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5^2 d^6 \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^4 a^5 d^3 \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^4 a^5 d^6 \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5^2 d^3 \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5^2 d^6 \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^2 \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^4 a^5 d^6 \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5^2 d^2 \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5^2 d^6 \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \\
& \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D \text{ ' } \\
\text{H- } & a^1 a^5 d^4 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a^1 a^5 d^6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^1 a^5 d^5 \cos@a4D \cos@a5D \\
& \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^1 a^5 d^6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^2 a^5 d^4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^2 a^5 d^6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a^2 a^5 d^5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^2 a^5 d^6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^1 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^1 a^5 d^6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a^1 a^5 d^5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^1 a^5 d^6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a^2 a^5 d^3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^2 a^5 d^6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^2 a^5 d^5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^2 a^5 d^6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a^1 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^1 a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^2 a^5 d^3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^2 a^5 d^4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^1 a^5 d^4 \cos@a4D^2 \cos@q1D \cos@q2D
\end{aligned}$$

[illegible]

[illegible]



[illegible]

[illegible]

$$\begin{aligned}
& a^5 d^3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a^3 a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a^3 a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a^3 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a^3 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a^3 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a^3 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a^5 d^1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a^5 d^2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a^4 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a^4 a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a^4 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a^4 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a^4 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a^4 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a^1 a^5 d^4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a^1 a^5 d^6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a^1 a^5 d^5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a^1 a^5 d^6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a^2 a^5 d^4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a^2 a^5 d^6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q6D + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a3 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\
& \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a3 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a3 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a3 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a5^2 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D - a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D
\end{aligned}$$

[illegible]



$$\begin{aligned}
& a^5 d^3 \cos@a3D \cos@a2D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a^4 a_5 d_1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^4 a_5 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5 d^2 d_1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5 d^2 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a^4 a_5 d_1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a_5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d^2 d_1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5 d^2 d_2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D L<, \\
8Ha1 d_5 \cos@a4D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D - \\
& a_1 d_6 \cos@a4D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D - \\
& a_1 d_5 \cos@a5D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D + \\
& a_1 d_6 \cos@a5D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D - \\
& a_3 d_5 \cos@a4D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D + \\
& a_3 d_6 \cos@a4D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D + \\
& a_3 d_5 \cos@a5D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D - \\
& a_3 d_6 \cos@a5D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D + \\
& a_1 d_4 \cos@a4D \cos@a6D \cos@q1D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@q1D \sin@q3D - \\
& a_1 d_5 \cos@a4D \cos@a6D \cos@q1D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@q1D \sin@q3D - \\
& a_3 d_4 \cos@a4D \cos@a6D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@q1D \sin@q3D + \\
& a_3 d_5 \cos@a4D \cos@a6D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@q1D \sin@q3D - \\
& a_1 d_4 \cos@a4D^2 \cos@q1D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D + \\
& a_1 d_6 \cos@a4D^2 \cos@q1D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D + \\
& a_1 d_5 \cos@a4D \cos@a5D \cos@q1D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D - \\
& a_1 d_6 \cos@a4D \cos@a5D \cos@q1D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D + \\
& a_3 d_4 \cos@a4D^2 \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D - \\
& a_3 d_6 \cos@a4D^2 \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D - \\
& a_3 d_5 \cos@a4D \cos@a5D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D + \\
& a_3 d_6 \cos@a4D \cos@a5D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D - \\
& a_1 d_5 \cos@a4D \cos@a6D \cos@q1D \cos@q3D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q4D + \\
& a_1 d_6 \cos@a4D \cos@a6D \cos@q1D \cos@q3D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q4D + \\
& a_1 d_5 \cos@a5D \cos@a6D \cos@q1D \cos@q3D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q4D - \\
& a_1 d_6 \cos@a5D \cos@a6D \cos@q1D \cos@q3D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q4D + \\
& a_4 d_5 \cos@a4D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q4D - \\
& a_4 d_6 \cos@a4D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q4D - \\
& a_4 d_5 \cos@a5D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q4D + \\
& a_4 d_6 \cos@a5D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q4D - \\
& a_1 d_3 \cos@a3D \cos@a6D \cos@q1D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@q1D \sin@q4D + \\
& a_1 d_5 \cos@a3D \cos@a6D \cos@q1D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@q1D \sin@q4D + \\
& a_4 d_3 \cos@a3D \cos@a6D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@q1D \sin@q4D - \\
& a_4 d_5 \cos@a3D \cos@a6D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@q1D \sin@q4D + \\
& a_1 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q6D \sin@a1D \sin@a4D \sin@a6D \sin@q1D \sin@q4D -
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q6D + a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q6D - \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q6D + a3 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q6D - \\
& a3 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q6D - a3 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \cos^2 q_5 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_4 \cos^2 q_5 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_4 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos^2 q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_2 \cos^2 q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_1 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 - a_5^2 d_2 \cos a_2 \cos a_4 \cos q_3 \\
& \cos^2 q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_3 \cos^2 q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 - a_1 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_3 \cos q_4 \\
& \cos^2 q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_4 \cos^2 q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos^2 q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_1 \cos^2 q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_2 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_2 a_5 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 + a_5^2 d_1 \cos a_1 \cos a_4 \cos q_3 \\
& \cos^2 q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_1 \cos a_4 \cos q_3 \cos^2 q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 + a_2 a_5 d_1 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \\
& \cos q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_1 \cos a_1 \cos a_3 \cos q_4 \\
& \cos^2 q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_4 \cos^2 q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_3 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 + \\
& a_3 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_4 \cos q_1 \\
& \cos^2 q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_1 \cos^2 q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_5 \sin q_6 + a_3 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 -
\end{aligned}$$

$$\begin{aligned}
& a^3 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a^3 a^5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^4 a^5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a^4 a^5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^4 a^5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a^4 a^5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D, \\
\text{Ha1} & d5 \cos@a4D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D - \\
& a1 d6 \cos@a4D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D - \\
& a1 d5 \cos@a5D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D + \\
& a1 d6 \cos@a5D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D - \\
& a3 d5 \cos@a4D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D + \\
& a3 d6 \cos@a4D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D + \\
& a3 d5 \cos@a5D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D - \\
& a3 d6 \cos@a5D \cos@a6D \cos@q3D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D + \\
& a1 d4 \cos@a4D \cos@a6D \cos@q1D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@q1D \sin@q3D - \\
& a1 d5 \cos@a4D \cos@a6D \cos@q1D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@q1D \sin@q3D - \\
& a3 d4 \cos@a4D \cos@a6D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@q1D \sin@q3D + \\
& a3 d5 \cos@a4D \cos@a6D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@q1D \sin@q3D - \\
& a1 d4 \cos@a4D^2 \cos@q1D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D + \\
& a1 d6 \cos@a4D^2 \cos@q1D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D + \\
& a1 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D - \\
& a1 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D + \\
& a3 d4 \cos@a4D^2 \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D - \\
& a3 d6 \cos@a4D^2 \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D -
\end{aligned}$$

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \text{Sin@a6D Sin@q1D Sin@q4D Sin@q5D} + \text{a1 a5 d5 Cos@a3D Cos@a5D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} - \\
& \text{a1 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} + \text{a4 a5 d3 Cos@a3D Cos@a4D Cos@q2D} \\
& \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} - \text{a4 a5 d6 Cos@a3D Cos@a4D Cos@q2D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \text{Sin@a6D Sin@q1D Sin@q4D Sin@q5D} - \text{a4 a5 d5 Cos@a3D Cos@a5D Cos@q2D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} + \\
& \text{a4 a5 d6 Cos@a3D Cos@a5D Cos@q2D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} + \text{a1 a5 d2 Cos@a2D Cos@a4D Cos@q1D} \\
& \text{Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} - \text{a1 a5 d6 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q1D Sin@q4D Sin@q5D} - \text{a1 a5 d5 Cos@a2D Cos@a5D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} + \\
& \text{a1 a5 d6 Cos@a2D Cos@a5D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} - \text{a4 a5 d2 Cos@a2D Cos@a4D Cos@q3D} \\
& \text{Cos@q4D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} + \text{a4 a5 d6 Cos@a2D Cos@a4D Cos@q3D Cos@q4D Cos@q6D Sin@a1D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q1D Sin@q4D Sin@q5D} + \text{a4 a5 d5 Cos@a2D Cos@a5D Cos@q3D Cos@q4D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} - \\
& \text{a4 a5 d6 Cos@a2D Cos@a5D Cos@q3D Cos@q4D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} - \text{a1 a5 d2 Cos@a2D Cos@a3D Cos@q1D} \\
& \text{Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} + \text{a1 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q4D Sin@q5D} + \text{a4 a5 d2 Cos@a2D Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} - \\
& \text{a4 a5 d3 Cos@a2D Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q4D Sin@q5D} + \text{a2 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\
& \text{Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} - \text{a2 a5 d6 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q5D} - \text{a2 a5 d5 Cos@a3D Cos@a5D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} + \\
& \text{a2 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} - \text{a4 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\
& \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} + \text{a4 a5 d6 Cos@a3D Cos@a4D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q5D} + \text{a4 a5 d5 Cos@a3D Cos@a5D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} - \\
& \text{a4 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} - \text{a2 a5 d1 Cos@a1D Cos@a4D Cos@q2D} \\
& \text{Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} + \text{a2 a5 d6 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q5D} + \text{a2 a5 d5 Cos@a1D Cos@a5D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} - \\
& \text{a2 a5 d6 Cos@a1D Cos@a5D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D} + \text{a4 a5 d1 Cos@a1D Cos@a4D Cos@q3D}
\end{aligned}$$

[illegible]

$$\begin{aligned}
& a^5 d^4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_1 a_5 d^2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a_1 a_5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a^5 d^2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a^5 d^4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a_1 a_5 d^2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a_1 a_5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a^5 d^2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a^5 d^3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_2 a_5 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a_2 a_5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_2 a_5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a_2 a_5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a^5 d^1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a_2 a_5 d^1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a_2 a_5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a^5 d^1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a^5 d^3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_3 a_5 d^2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a_3 a_5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a_3 a_5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a_3 a_5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a_3 a_5 d^1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a_3 a_5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D
\end{aligned}$$



[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_3 a_5 d_6 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_3 a_5 d_5 \cos a_1 \cos a_5 \cos q_2 \\
& \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_3 a_5 d_6 \cos a_1 \cos a_5 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_4 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_4 a_5 d_6 \cos a_1 \cos a_4 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_5 \cos a_1 \cos a_5 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_6 \cos a_1 \cos a_5 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_3 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_3 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_4 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_4 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_4 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_1 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 - a_5^2 d_2 \cos a_2 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_3 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 - a_1 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_3 \cos q_4 \\
& \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_4 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_2 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_2 a_5 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 + a_5^2 d_1 \cos a_1 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 -
\end{aligned}$$

$$\begin{aligned}
& a^5 d_4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a_2 a_5 d_1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a_2 a_5 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d_1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d_3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a_3 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a_3 a_5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d_2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a_3 a_5 d_1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a_3 a_5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^5 d_1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a_3 a_5 d_1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a_3 a_5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d_1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d_2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a_4 a_5 d_2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a_4 a_5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d_2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a_4 a_5 d_1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a_4 a_5 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5 d_1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a_4 a_5 d_1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a_4 a_5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d_1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5 d_2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D, \\
& Ha1 a_5 \cos@a4D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \\
& \sin@q3D \sin@q5D - a_3 a_5 \cos@a4D \cos@q3D \cos@q4D \cos@q6D \sin@a1D \sin@a3D \\
& \sin@a4D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - a_1 a_5 \cos@a4D \cos@q1D \cos@q5D
\end{aligned}$$

$$\begin{aligned}
& \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_3 \sin q_5 + \\
& a_3 a_5 \cos a_4 \cos q_3 \cos q_5 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_3 \sin q_5 - a_1 a_5 \cos a_4 \cos q_1 \cos q_3 \cos q_6 \sin a_1 \\
& \sin a_3 \sin a_4 \sin a_6 \sin q_1 \sin q_4 \sin q_5 + a_4 a_5 \cos a_4 \cos q_3 \\
& \cos q_4 \cos q_6 \sin a_1 \sin a_3 \sin a_4 \sin a_6 \sin q_1 \sin q_4 \sin q_5 + \\
& a_1 a_5 \cos a_3 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_4 \sin q_5 - a_4 a_5 \cos a_3 \cos q_4 \cos q_5 \cos q_6 \sin a_1 \\
& \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_4 \sin q_5 + a_3 a_5 \cos a_4 \cos q_1 \\
& \cos q_3 \cos q_6 \sin a_1 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_5 - \\
& a_4 a_5 \cos a_4 \cos q_1 \cos q_4 \cos q_6 \sin a_1 \sin a_3 \sin a_4 \sin a_6 \\
& \sin q_3 \sin q_4 \sin q_5 - a_3 a_5 \cos a_1 \cos q_3 \cos q_5 \cos q_6 \sin a_3 \\
& \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_5 + a_4 a_5 \cos a_1 \cos q_4 \\
& \cos q_5 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_5 + \\
& a_1 a_5 \cos a_4 \cos q_1 \cos q_3 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5^2 - \\
& a_5^2 \cos a_4 \cos q_3 \cos q_5 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5^2 - \\
& a_1 a_5 \cos a_3 \cos q_1 \cos q_4 \cos q_6 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5^2 + \\
& a_5^2 \cos a_3 \cos q_4 \cos q_5 \cos q_6 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5^2 - \\
& a_3 a_5 \cos a_4 \cos q_1 \cos q_3 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 + \\
& a_5^2 \cos a_4 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 + \\
& a_3 a_5 \cos a_1 \cos q_3 \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 - \\
& a_5^2 \cos a_1 \cos q_4 \cos q_5 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 + \\
& a_4 a_5 \cos a_3 \cos q_1 \cos q_4 \cos q_6 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_5^2 \cos a_3 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_4 a_5 \cos a_1 \cos q_3 \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_5^2 \cos a_1 \cos q_3 \cos q_5 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_1 a_5 \cos a_4 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_3 \sin q_6 + a_3 a_5 \cos a_4 \cos q_3 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_4 \sin a_6 \sin q_1 \sin q_3 \sin q_6 + \\
& a_1 a_5 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_3 \sin q_6 - \\
& a_3 a_5 \cos a_4 \cos q_3 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_3 \sin q_6 + \\
& a_1 a_5 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_4 \sin q_6 - a_4 a_5 \cos a_4 \cos q_3 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_4 \sin a_6 \sin q_1 \sin q_4 \sin q_6 - \\
& a_1 a_5 \cos a_3 \cos q_1 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_4 \sin q_6 + \\
& a_4 a_5 \cos a_3 \cos q_4 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_4 \sin q_6 - \\
& a_3 a_5 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_4 a_5 \cos a_4 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_3 a_5 \cos a_1 \cos q_3 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_4 a_5 \cos a_1 \cos q_4 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_1 a_5 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \\
& \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_5^2 \cos a_4 \cos q_3 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \\
& \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 \cos a_3 \cos q_4 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 +
\end{aligned}$$

$$\begin{aligned}
& \text{a3 a5 Cos@a4D Cos@q1D Cos@a3D Cos@q5D Sin@a1D} \\
& \quad \text{Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -} \\
& \text{a5}^2 \text{Cos@a4D Cos@q1D Cos@q5D}^2 \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -} \\
& \text{a3 a5 Cos@a1D Cos@q3D Cos@q4D Cos@q5D Sin@a3D} \\
& \quad \text{Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D +} \\
& \text{a5}^2 \text{Cos@a1D Cos@q4D Cos@q5D}^2 \text{Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -} \\
& \text{a4 a5 Cos@a3D Cos@q1D Cos@q4D Cos@q5D Sin@a1D} \\
& \quad \text{Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6D +} \\
& \text{a5}^2 \text{Cos@a3D Cos@q1D Cos@q5D}^2 \text{Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6D +} \\
& \text{a4 a5 Cos@a1D Cos@q3D Cos@q4D Cos@q5D Sin@a3D} \\
& \quad \text{Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6D -} \\
& \text{a5}^2 \text{Cos@a1D Cos@q3D Cos@q5D}^2 \text{Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6DL }' \\
H- & \text{a1 a5 d4 Cos@a4D}^2 \text{Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D} \\
& \quad \text{Sin@q1D Sin@q2D Sin@q5D + a1 a5 d6 Cos@a4D}^2 \text{Cos@q1D Cos@q3D Cos@q6D Sin@a1D} \\
& \quad \text{Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a1 a5 d5 Cos@a4D Cos@a5D} \\
& \quad \text{Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a1 a5 d6 Cos@a4D Cos@a5D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a2 a5 d4 Cos@a4D}^2 \text{Cos@q2D Cos@q3D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a2 a5 d6 Cos@a4D}^2 \text{Cos@q2D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D} \\
& \quad \text{Sin@q1D Sin@q2D Sin@q5D - a2 a5 d5 Cos@a4D Cos@a5D Cos@q2D Cos@q3D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a2 a5 d6 Cos@a4D Cos@a5D Cos@q2D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a1 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a1 a5 d6 Cos@a3D Cos@a4D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D - a1 a5 d5 Cos@a3D Cos@a5D Cos@q1D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a1 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D - a2 a5 d3 Cos@a3D Cos@a4D Cos@q2D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a2 a5 d6 Cos@a3D Cos@a4D Cos@q2D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a2 a5 d5 Cos@a3D Cos@a5D Cos@q2D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a2 a5 d6 Cos@a3D Cos@a5D Cos@q2D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D - a1 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\
& \quad \text{Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a1 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a2 a5 d3 Cos@a3D Cos@a4D Cos@q2D} \\
& \quad \text{Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a2 a5 d4 Cos@a3D Cos@a4D Cos@q2D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a1 a5 d4 Cos@a4D}^2 \text{Cos@q1D Cos@q2D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q5D -} \\
& \text{a1 a5 d6 Cos@a4D}^2 \text{Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D} \\
& \quad \text{Sin@q1D Sin@q3D Sin@q5D - a1 a5 d5 Cos@a4D Cos@a5D Cos@q1D Cos@q2D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q5D +}
\end{aligned}$$

[illegible]



[illegible]

[illegible]

$$\begin{aligned}
& a_4 a_5 d_6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D - a_3 a_5 d_1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a_3 a_5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a_4 a_5 d_1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a_4 a_5 d_2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a_1 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a_1 a_5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_5^2 d_3 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a_5^2 d_4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_1 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a_1 a_5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a_5^2 d_2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a_5^2 d_4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a_1 a_5 d_2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a_1 a_5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_5^2 d_2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a_5^2 d_3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_2 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a_2 a_5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_5^2 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a_5^2 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_2 a_5 d_1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a_2 a_5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a_5^2 d_1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a_5^2 d_4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a_2 a_5 d_1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a_2 a_5 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_5^2 d_1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a_5^2 d_3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_3 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a_3 a_5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]



$$\begin{aligned}
& a^5 d^3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a^2 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^2 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^2 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a^2 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d^3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^3 a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^3 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^3 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a^3 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d^2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^4 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a^4 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^4 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D
\end{aligned}$$



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d3 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D
\end{aligned}$$

$$\begin{aligned}
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D -
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]



$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D
\end{aligned}$$

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q6D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a2 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a2 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a2 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a2 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a1D \cos@a4D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d5 \cos@a1D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a1D \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q6D + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a3 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\
& \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a3 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d5 \cos@a2D \cos@a5D \cos@q1D
\end{aligned}$$

$$\begin{aligned}
& \cos q_4 \cos q_5 \sin a_1 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_4 a_5 d_6 \cos a_2 \cos a_5 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_3 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \\
& \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_3 a_5 d_6 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_3 a_5 d_5 \cos a_1 \cos a_5 \cos q_2 \\
& \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_3 a_5 d_6 \cos a_1 \cos a_5 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_4 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_4 a_5 d_6 \cos a_1 \cos a_4 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_5 \cos a_1 \cos a_5 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_6 \cos a_1 \cos a_5 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_3 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_3 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_4 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_4 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_4 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_1 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 - a_5^2 d_2 \cos a_2 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_3 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 - a_1 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_3 \cos q_4 \\
& \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_4 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_2 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 +
\end{aligned}$$



$$\begin{aligned} & \text{a2 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a5D} \\ & \text{Sin@a6D Sin@q2D Sin@q5D Sin@q6D + a5^2 d1 Cos@a1D Cos@a4D Cos@q3D} \\ & \text{Cos@q5D}^2 \text{ Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D -} \\ & \text{a5^2 d4 Cos@a1D Cos@a4D Cos@q3D Cos@q5D}^2 \text{ Sin@a2D Sin@a3D Sin@a5D Sin@a6D} \\ & \text{Sin@q2D Sin@q5D Sin@q6D + a2 a5 d1 Cos@a1D Cos@a3D Cos@q2D Cos@q4D} \\ & \text{Cos@q5D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D -} \\ & \text{a2 a5 d3 Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q5D Sin@a2D Sin@a4D Sin@a5D} \\ & \text{Sin@a6D Sin@q2D Sin@q5D Sin@q6D - a5^2 d1 Cos@a1D Cos@a3D Cos@q4D} \\ & \text{Cos@q5D}^2 \text{ Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D +} \\ & \text{a5^2 d3 Cos@a1D Cos@a3D Cos@q4D Cos@q5D}^2 \text{ Sin@a2D Sin@a4D Sin@a5D Sin@a6D} \\ & \text{Sin@q2D Sin@q5D Sin@q6D - a3 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q3D} \\ & \text{Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D +} \\ & \text{a3 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D} \\ & \text{Sin@a6D Sin@q3D Sin@q5D Sin@q6D + a5^2 d2 Cos@a2D Cos@a4D Cos@q1D} \\ & \text{Cos@q5D}^2 \text{ Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -} \\ & \text{a5^2 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q5D}^2 \text{ Sin@a1D Sin@a3D Sin@a5D Sin@a6D} \\ & \text{Sin@q3D Sin@q5D Sin@q6D + a3 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q3D} \\ & \text{Cos@q5D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -} \\ & \text{a3 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a5D} \\ & \text{Sin@a6D Sin@q3D Sin@q5D Sin@q6D - a5^2 d1 Cos@a1D Cos@a4D Cos@q2D} \\ & \text{Cos@q5D}^2 \text{ Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D +} \\ & \text{a5^2 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q5D}^2 \text{ Sin@a2D Sin@a3D Sin@a5D Sin@a6D} \\ & \text{Sin@q3D Sin@q5D Sin@q6D - a3 a5 d1 Cos@a1D Cos@a2D Cos@q3D Cos@q4D} \\ & \text{Cos@q5D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D +} \\ & \text{a3 a5 d2 Cos@a1D Cos@a2D Cos@q3D Cos@q4D Cos@q5D Sin@a3D Sin@a4D Sin@a5D} \\ & \text{Sin@a6D Sin@q3D Sin@q5D Sin@q6D + a5^2 d1 Cos@a1D Cos@a2D Cos@q4D} \\ & \text{Cos@q5D}^2 \text{ Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -} \\ & \text{a5^2 d2 Cos@a1D Cos@a2D Cos@q4D Cos@q5D}^2 \text{ Sin@a3D Sin@a4D Sin@a5D Sin@a6D} \\ & \text{Sin@q3D Sin@q5D Sin@q6D + a4 a5 d2 Cos@a2D Cos@a3D Cos@q1D Cos@q4D} \\ & \text{Cos@q5D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6D -} \\ & \text{a4 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a4D Sin@a5D} \\ & \text{Sin@a6D Sin@q4D Sin@q5D Sin@q6D - a5^2 d2 Cos@a2D Cos@a3D Cos@q1D} \\ & \text{Cos@q5D}^2 \text{ Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6D +} \\ & \text{a5^2 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q5D}^2 \text{ Sin@a1D Sin@a4D Sin@a5D Sin@a6D} \\ & \text{Sin@q4D Sin@q5D Sin@q6D - a4 a5 d1 Cos@a1D Cos@a3D Cos@q2D Cos@q4D} \\ & \text{Cos@q5D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6D +} \\ & \text{a4 a5 d3 Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q5D Sin@a2D Sin@a4D Sin@a5D} \\ & \text{Sin@a6D Sin@q4D Sin@q5D Sin@q6D + a5^2 d1 Cos@a1D Cos@a3D Cos@q2D} \\ & \text{Cos@q5D}^2 \text{ Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6D -} \\ & \text{a5^2 d3 Cos@a1D Cos@a3D Cos@q2D Cos@q5D}^2 \text{ Sin@a2D Sin@a4D Sin@a5D Sin@a6D} \\ & \text{Sin@q4D Sin@q5D Sin@q6D + a4 a5 d1 Cos@a1D Cos@a2D Cos@q3D Cos@q4D} \\ & \text{Cos@q5D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6D -} \\ & \text{a4 a5 d2 Cos@a1D Cos@a2D Cos@q3D Cos@q4D Cos@q5D Sin@a3D Sin@a4D Sin@a5D} \\ & \text{Sin@a6D Sin@q4D Sin@q5D Sin@q6D - a5^2 d1 Cos@a1D Cos@a2D Cos@q3D Cos@q5D}^2 \\ & \text{Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6D + a5^2 d2 Cos@a1D Cos@a2D} \\ & \text{Cos@q3D Cos@q5D}^2 \text{ Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6DL,} \end{aligned}$$

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d6 \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d6 \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d1 \cos@a1D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d6 \cos@a1D \cos@q3D \cos@q4D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d1 \cos@a1D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d6 \cos@a1D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d6 \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d6 \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d1 \cos@a1D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d6 \cos@a1D \cos@q3D \cos@q4D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d1 \cos@a1D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d6 \cos@a1D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a1 a5 d5 \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q6D + a1 a5 d6 \cos@a5D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + \\
& a3 a5 d5 \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q6D - a3 a5 d6 \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \\
& \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + a1 a5 d4 \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q3D \sin@q6D - \\
& a1 a5 d6 \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \\
& \sin@q3D \sin@q6D - a3 a5 d4 \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \\
& \sin@a5D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + a3 a5 d6 \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + \\
& a1 a5 d5 \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q6D - a1 a5 d6 \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a4 a5 d5 \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q6D + a4 a5 d6 \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \\
& \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a1 a5 d3 \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \\
& \sin@q4D \sin@q6D + a4 a5 d3 \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \\
& \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d6 \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a3 a5 d5 \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D + a3 a5 d6 \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a4 a5 d5 \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D - a4 a5 d6 \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D
\end{aligned}$$

$$\begin{aligned}
& \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a3 a5 d1 \cos@a1D \cos@q3D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d6 \cos@a1D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \\
& \sin@q4D \sin@q6D - a4 a5 d1 \cos@a1D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \\
& \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d6 \cos@a1D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a1 a5 d4 \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a1 a5 d6 \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d6 \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a1 a5 d3 \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a1 a5 d6 \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a5^2 d6 \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a3 a5 d4 \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a3 a5 d6 \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d6 \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d1 \cos@a1D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a3 a5 d6 \cos@a1D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d1 \cos@a1D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d6 \cos@a1D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a4 a5 d6 \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d6 \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d1 \cos@a1D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a4 a5 d6 \cos@a1D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d1 \cos@a1D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d6 \cos@a1D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \\
& \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D ' \\
H- & a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d5 \cos@a4D \cos@a5D \\
& \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]



$$\begin{aligned}
& a_1^5 d_3 \cos @a_2D \cos @a_3D \cos @q_1D \cos @q_4D \cos @q_6D \sin@a_1D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_1D \sin@q_5D^2 - a_5^2 d_2 \cos @a_2D \cos @a_3D \cos @q_4D \cos @q_5D \\
& \cos @q_6D \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_1D \sin@q_5D^2 + \\
& a_5^2 d_3 \cos @a_2D \cos @a_3D \cos @q_4D \cos @q_5D \cos @q_6D \sin@a_1D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_1D \sin@q_5D^2 - a_2 a_5 d_3 \cos @a_3D \cos @a_4D \cos @q_1D \\
& \cos @q_2D \cos @q_6D \sin@a_1D \sin@a_2D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 + \\
& a_2 a_5 d_4 \cos @a_3D \cos @a_4D \cos @q_1D \cos @q_2D \cos @q_6D \sin@a_1D \sin@a_2D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 + a_5^2 d_3 \cos @a_3D \cos @a_4D \cos @q_1D \cos @q_5D \\
& \cos @q_6D \sin@a_1D \sin@a_2D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 - \\
& a_5^2 d_4 \cos @a_3D \cos @a_4D \cos @q_1D \cos @q_5D \cos @q_6D \sin@a_1D \sin@a_2D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 + a_2 a_5 d_1 \cos@a_1D \cos@a_4D \cos@q_2D \\
& \cos@q_3D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 - \\
& a_2 a_5 d_4 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_3D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 - a_5^2 d_1 \cos@a_1D \cos@a_4D \cos@q_3D \cos@q_5D \\
& \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 + \\
& a_5^2 d_4 \cos@a_1D \cos@a_4D \cos@q_3D \cos@q_5D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 - a_2 a_5 d_1 \cos@a_1D \cos@a_3D \cos@q_2D \\
& \cos@q_4D \cos@q_6D \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 + \\
& a_2 a_5 d_3 \cos@a_1D \cos@a_3D \cos@q_2D \cos@q_4D \cos@q_6D \sin@a_2D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 + a_5^2 d_1 \cos@a_1D \cos@a_3D \cos@q_4D \cos@q_5D \\
& \cos@q_6D \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 - \\
& a_5^2 d_3 \cos@a_1D \cos@a_3D \cos@q_4D \cos@q_5D \cos@q_6D \sin@a_2D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 + a_3 a_5 d_2 \cos@a_2D \cos@a_4D \cos@q_1D \\
& \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 - \\
& a_3 a_5 d_4 \cos@a_2D \cos@a_4D \cos@q_1D \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 - a_5^2 d_2 \cos@a_2D \cos@a_4D \cos@q_1D \cos@q_5D \\
& \cos@q_6D \sin@a_1D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 + \\
& a_5^2 d_4 \cos@a_2D \cos@a_4D \cos@q_1D \cos@q_5D \cos@q_6D \sin@a_1D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 - a_3 a_5 d_1 \cos@a_1D \cos@a_4D \cos@q_2D \\
& \cos@q_3D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 + \\
& a_3 a_5 d_4 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_3D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 + a_5^2 d_1 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_5D \\
& \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 - \\
& a_5^2 d_4 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_5D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 + a_3 a_5 d_1 \cos@a_1D \cos@a_2D \cos@q_3D \\
& \cos@q_4D \cos@q_6D \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 - \\
& a_3 a_5 d_2 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_4D \cos@q_6D \sin@a_3D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 - a_5^2 d_1 \cos@a_1D \cos@a_2D \cos@q_4D \cos@q_5D \\
& \cos@q_6D \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 + \\
& a_5^2 d_2 \cos@a_1D \cos@a_2D \cos@q_4D \cos@q_5D \cos@q_6D \sin@a_3D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 - a_4 a_5 d_2 \cos@a_2D \cos@a_3D \cos@q_1D \\
& \cos@q_4D \cos@q_6D \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D^2 + \\
& a_4 a_5 d_3 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_4D \cos@q_6D \sin@a_1D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_4D \sin@q_5D^2 + a_5^2 d_2 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_5D \\
& \cos@q_6D \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D^2 - \\
& a_5^2 d_3 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_5D \cos@q_6D \sin@a_1D \sin@a_4D \sin@a_5D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q6D + a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_6 \cos a_1 \cos a_5 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_3 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_3 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_4 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_4 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_4 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_1 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 - a_5^2 d_2 \cos a_2 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_3 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 - a_1 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_3 \cos q_4 \\
& \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_4 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_2 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_2 a_5 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 + a_5^2 d_1 \cos a_1 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_1 \cos a_4 \cos q_3 \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 + a_2 a_5 d_1 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \\
& \cos q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_1 \cos a_1 \cos a_3 \cos q_4 \\
& \cos q_5^2 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_4 \cos q_5^2 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_3 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 +
\end{aligned}$$

$$\begin{aligned}
& a^3 a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5^2 d^2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5^2 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^3 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^3 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^5^2 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5^2 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a^3 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5^2 d^1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5^2 d^2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^4 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5^2 d^2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5^2 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a^4 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^4 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5^2 d^1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5^2 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a^4 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5^2 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5^2 d^2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D <, \\
8H- & a^1 d^5 \cos@a4D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a^1 d^6 \cos@a4D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a^1 d^5 \cos@a5D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a^1 d^6 \cos@a5D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a^2 d^5 \cos@a4D \cos@a6D \cos@q2D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a^2 d^6 \cos@a4D \cos@a6D \cos@q2D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a^2 d^5 \cos@a5D \cos@a6D \cos@q2D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a^2 d^6 \cos@a5D \cos@a6D \cos@q2D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a^1 d^4 \cos@a4D \cos@a6D \cos@q1D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D + \\
& a^1 d^5 \cos@a4D \cos@a6D \cos@q1D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D + \\
& a^2 d^4 \cos@a4D \cos@a6D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D - \\
& a^2 d^5 \cos@a4D \cos@a6D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D +
\end{aligned}$$

[illegible]



a4 d5 Cos@a1D Cos@a5D Cos@q4D Cos@q6D Sin@a2D Sin@a6D Sin@q4D -  
a4 d6 Cos@a1D Cos@a5D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D +  
a1 d4 Cos@a4D Cos@a6D Cos@q1D Cos@q2D Sin@a1D Sin@a2D Sin@a5D Sin@q1D Sin@q5D -  
a1 d5 Cos@a4D Cos@a6D Cos@q1D Cos@q2D Sin@a1D Sin@a2D Sin@a5D Sin@q1D Sin@q5D -  
a5 d4 Cos@a4D Cos@a6D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@q1D Sin@q5D +  
a5 d5 Cos@a4D Cos@a6D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@q1D Sin@q5D -  
a1 d2 Cos@a2D Cos@a6D Cos@q1D Cos@q4D Sin@a1D Sin@a4D Sin@a5D Sin@q1D Sin@q5D +  
a1 d5 Cos@a2D Cos@a6D Cos@q1D Cos@q4D Sin@a1D Sin@a4D Sin@a5D Sin@q1D Sin@q5D  
a5 d2 Cos@a2D Cos@a6D Cos@q4D Cos@q5D Sin@a1D Sin@a4D Sin@a5D Sin@q1D Sin@q5D  
a5 d5 Cos@a2D Cos@a6D Cos@q4D Cos@q5D Sin@a1D Sin@a4D Sin@a5D Sin@q1D Sin@q5D +  
a5 d4 Cos@a4D<sup>2</sup> Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a6D Sin@q1D Sin@q5D -  
a5 d6 Cos@a4D<sup>2</sup> Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a6D Sin@q1D Sin@q5D -  
a5 d5 Cos@a4D Cos@a5D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a6D Sin@q1D Sin@q5D +  
a5 d6 Cos@a4D Cos@a5D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a6D Sin@q1D Sin@q5D -  
a5 d2 Cos@a2D Cos@a4D Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a6D Sin@q1D Sin@q5D +  
a5 d6 Cos@a2D Cos@a4D Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a6D Sin@q1D Sin@q5D +  
a5 d5 Cos@a2D Cos@a5D Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a6D Sin@q1D Sin@q5D -  
a5 d6 Cos@a2D Cos@a5D Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a6D Sin@q1D Sin@q5D +  
a1 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q6D Sin@a1D Sin@a5D Sin@a6D Sin@q1D Sin@q5D -  
a1 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q6D Sin@a1D Sin@a5D Sin@a6D Sin@q1D Sin@q5D -  
a2 d4 Cos@a4D Cos@a6D Cos@q1D Cos@q2D Sin@a1D Sin@a2D Sin@a5D Sin@q2D Sin@q5D +  
a2 d5 Cos@a4D Cos@a6D Cos@q1D Cos@q2D Sin@a1D Sin@a2D Sin@a5D Sin@q2D Sin@q5D +  
a5 d4 Cos@a4D Cos@a6D Cos@q1D Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@q2D Sin@q5D  
a5 d5 Cos@a4D Cos@a6D Cos@q1D Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@q2D Sin@q5D +  
a2 d1 Cos@a1D Cos@a6D Cos@q2D Cos@q4D Sin@a2D Sin@a4D Sin@a5D Sin@q2D Sin@q5D -  
a2 d5 Cos@a1D Cos@a6D Cos@q2D Cos@q4D Sin@a2D Sin@a4D Sin@a5D Sin@q2D Sin@q5D -  
a5 d1 Cos@a1D Cos@a6D Cos@q4D Cos@q5D Sin@a2D Sin@a4D Sin@a5D Sin@q2D Sin@q5D +  
a5 d5 Cos@a1D Cos@a6D Cos@q4D Cos@q5D Sin@a2D Sin@a4D Sin@a5D Sin@q2D Sin@q5D -  
a5 d4 Cos@a4D<sup>2</sup> Cos@q1D Cos@q6D Sin@a1D Sin@a2D Sin@a6D Sin@q2D Sin@q5D +  
a5 d6 Cos@a4D<sup>2</sup> Cos@q1D Cos@q6D Sin@a1D Sin@a2D Sin@a6D Sin@q2D Sin@q5D +  
a5 d5 Cos@a4D Cos@a5D Cos@q1D Cos@q6D Sin@a1D Sin@a2D Sin@a6D Sin@q2D Sin@q5D -  
a5 d6 Cos@a4D Cos@a5D Cos@q1D Cos@q6D Sin@a1D Sin@a2D Sin@a6D Sin@q2D Sin@q5D +  
a5 d1 Cos@a1D Cos@a4D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q5D -  
a5 d6 Cos@a1D Cos@a4D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q5D -  
a5 d5 Cos@a1D Cos@a5D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q5D +  
a5 d6 Cos@a1D Cos@a5D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q5D -  
a2 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q6D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D +  
a2 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q6D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D +  
a4 d2 Cos@a2D Cos@a6D Cos@q1D Cos@q4D Sin@a1D Sin@a4D Sin@a5D Sin@q4D Sin@q5D -  
a4 d5 Cos@a2D Cos@a6D Cos@q1D Cos@q4D Sin@a1D Sin@a4D Sin@a5D Sin@q4D Sin@q5D -  
a5 d2 Cos@a2D Cos@a6D Cos@q1D Cos@q5D Sin@a1D Sin@a4D Sin@a5D Sin@q4D Sin@q5D +  
a5 d5 Cos@a2D Cos@a6D Cos@q1D Cos@q5D Sin@a1D Sin@a4D Sin@a5D Sin@q4D Sin@q5D -  
a4 d1 Cos@a1D Cos@a6D Cos@q2D Cos@q4D Sin@a2D Sin@a4D Sin@a5D Sin@q4D Sin@q5D +  
a4 d5 Cos@a1D Cos@a6D Cos@q2D Cos@q4D Sin@a2D Sin@a4D Sin@a5D Sin@q4D Sin@q5D +  
a5 d1 Cos@a1D Cos@a6D Cos@q2D Cos@q5D Sin@a2D Sin@a4D Sin@a5D Sin@q4D Sin@q5D -  
a5 d5 Cos@a1D Cos@a6D Cos@q2D Cos@q5D Sin@a2D Sin@a4D Sin@a5D Sin@q4D Sin@q5D

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D
\end{aligned}$$



[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a2D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a2D \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q6D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a2 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a2 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a2 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a2 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a1D \cos@a4D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d5 \cos@a1D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a1D \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q6D + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a3 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\
& \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a3 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d2 \cos@a2D \cos@a4D \cos@q1D
\end{aligned}$$

[illegible]

$$\begin{aligned}
& a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^2 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^2 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a^2 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d^3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^3 a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^3 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^3 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a^3 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d^2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^4 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^3 \cos@a1D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a^4 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^4 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a^4 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D
\end{aligned}$$

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D
\end{aligned}$$

[illegible]

[illegible]



[illegible]

[illegible]

a1 a5 d4 Cos@a2D Cos@a3D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a5D  
Sin@a6D Sin@q1D Sin@q5D Sin@q6D - a5<sup>2</sup> d2 Cos@a2D Cos@a4D Cos@q3D  
Cos@q5D<sup>2</sup> Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D +  
a5<sup>2</sup> d4 Cos@a2D Cos@a4D Cos@q3D Cos@q5D<sup>2</sup> Sin@a1D Sin@a3D Sin@a5D Sin@a6D  
Sin@q1D Sin@q5D Sin@q6D - a1 a5 d2 Cos@a2D Cos@a3D Cos@q1D Cos@q4D  
Cos@q5D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D +  
a1 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a4D Sin@a5D  
Sin@a6D Sin@q1D Sin@q5D Sin@q6D + a5<sup>2</sup> d2 Cos@a2D Cos@a3D Cos@q4D  
Cos@q5D<sup>2</sup> Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D -  
a5<sup>2</sup> d3 Cos@a2D Cos@a3D Cos@q4D Cos@q5D<sup>2</sup> Sin@a1D Sin@a4D Sin@a5D Sin@a6D  
Sin@q1D Sin@q5D Sin@q6D + a2 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q2D  
Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D -  
a2 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a5D  
Sin@a6D Sin@q2D Sin@q5D Sin@q6D - a5<sup>2</sup> d3 Cos@a3D Cos@a4D Cos@q1D  
Cos@q5D<sup>2</sup> Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D +  
a5<sup>2</sup> d4 Cos@a3D Cos@a4D Cos@q1D Cos@q5D<sup>2</sup> Sin@a1D Sin@a2D Sin@a5D Sin@a6D  
Sin@q2D Sin@q5D Sin@q6D - a2 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q3D  
Cos@q5D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D +  
a2 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a5D  
Sin@a6D Sin@q2D Sin@q5D Sin@q6D + a5<sup>2</sup> d1 Cos@a1D Cos@a4D Cos@q3D  
Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D -  
a5<sup>2</sup> d4 Cos@a1D Cos@a4D Cos@q3D Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D  
Sin@q2D Sin@q5D Sin@q6D + a2 a5 d1 Cos@a1D Cos@a3D Cos@q2D Cos@q4D  
Cos@q5D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D -  
a2 a5 d3 Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q5D Sin@a2D Sin@a4D Sin@a5D  
Sin@a6D Sin@q2D Sin@q5D Sin@q6D - a5<sup>2</sup> d1 Cos@a1D Cos@a3D Cos@q4D  
Cos@q5D<sup>2</sup> Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D +  
a5<sup>2</sup> d3 Cos@a1D Cos@a3D Cos@q4D Cos@q5D<sup>2</sup> Sin@a2D Sin@a4D Sin@a5D Sin@a6D  
Sin@q2D Sin@q5D Sin@q6D - a3 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q3D  
Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D +  
a3 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D  
Sin@a6D Sin@q3D Sin@q5D Sin@q6D + a5<sup>2</sup> d2 Cos@a2D Cos@a4D Cos@q1D  
Cos@q5D<sup>2</sup> Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -  
a5<sup>2</sup> d4 Cos@a2D Cos@a4D Cos@q1D Cos@q5D<sup>2</sup> Sin@a1D Sin@a3D Sin@a5D Sin@a6D  
Sin@q3D Sin@q5D Sin@q6D + a3 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q3D  
Cos@q5D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -  
a3 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a5D  
Sin@a6D Sin@q3D Sin@q5D Sin@q6D - a5<sup>2</sup> d1 Cos@a1D Cos@a4D Cos@q2D  
Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D +  
a5<sup>2</sup> d4 Cos@a1D Cos@a4D Cos@q2D Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D  
Sin@q3D Sin@q5D Sin@q6D - a3 a5 d1 Cos@a1D Cos@a2D Cos@q3D Cos@q4D  
Cos@q5D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D +  
a3 a5 d2 Cos@a1D Cos@a2D Cos@q3D Cos@q4D Cos@q5D Sin@a3D Sin@a4D Sin@a5D  
Sin@a6D Sin@q3D Sin@q5D Sin@q6D + a5<sup>2</sup> d1 Cos@a1D Cos@a2D Cos@q4D  
Cos@q5D<sup>2</sup> Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -  
a5<sup>2</sup> d2 Cos@a1D Cos@a2D Cos@q4D Cos@q5D<sup>2</sup> Sin@a3D Sin@a4D Sin@a5D Sin@a6D

$$\begin{aligned}
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6DL, \\
H- a1 a5 \cos@a4D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \\
& \sin@q2D \sin@q5D + a2 a5 \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \\
& \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a1 a5 \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D - a4 a5 \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D - \\
& a1 a5 \cos@a2D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q5D + a4 a5 \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \\
& \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q5D - a2 a5 \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q5D + \\
& a4 a5 \cos@a4D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q5D + a2 a5 \cos@a1D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \\
& \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q5D - a4 a5 \cos@a1D \cos@q4D \\
& \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q5D - \\
& a1 a5 \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a1 a5 \cos@a2D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a5^2 \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a2 a5 \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 \cos@a1D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 \cos@a1D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a4 a5 \cos@a2D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 \cos@a2D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 \cos@a1D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 \cos@a1D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 +
\end{aligned}$$

$$\begin{aligned}
& a_1 a_5 \cos@a_4D \cos@q_1D \cos@q_4D \cos@q_5D \sin@a_1D \sin@a_2D \sin@a_4D \\
& \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_6D - a_2 a_5 \cos@a_4D \cos@q_2D \cos@q_4D \\
& \cos@q_5D \sin@a_1D \sin@a_2D \sin@a_4D \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_6D - \\
& a_1 a_5 \cos@a_4D \cos@q_1D \cos@q_5D^2 \sin@a_1D \sin@a_2D \sin@a_5D \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_6D + \\
& a_2 a_5 \cos@a_4D \cos@q_2D \cos@q_5D^2 \sin@a_1D \sin@a_2D \sin@a_5D \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_6D - \\
& a_1 a_5 \cos@a_4D \cos@q_1D \cos@q_2D \cos@q_5D \sin@a_1D \sin@a_2D \sin@a_4D \\
& \sin@a_6D \sin@q_1D \sin@q_4D \sin@q_6D + a_4 a_5 \cos@a_4D \cos@q_2D \cos@q_4D \\
& \cos@q_5D \sin@a_1D \sin@a_2D \sin@a_4D \sin@a_6D \sin@q_1D \sin@q_4D \sin@q_6D + \\
& a_1 a_5 \cos@a_2D \cos@q_1D \cos@q_5D^2 \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_1D \sin@q_4D \sin@q_6D - \\
& a_4 a_5 \cos@a_2D \cos@q_4D \cos@q_5D^2 \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_1D \sin@q_4D \sin@q_6D + \\
& a_2 a_5 \cos@a_4D \cos@q_1D \cos@q_2D \cos@q_5D \sin@a_1D \sin@a_2D \sin@a_4D \\
& \sin@a_6D \sin@q_2D \sin@q_4D \sin@q_6D - a_4 a_5 \cos@a_4D \cos@q_1D \cos@q_4D \\
& \cos@q_5D \sin@a_1D \sin@a_2D \sin@a_4D \sin@a_6D \sin@q_2D \sin@q_4D \sin@q_6D - \\
& a_2 a_5 \cos@a_1D \cos@q_2D \cos@q_5D^2 \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_4D \sin@q_6D + \\
& a_4 a_5 \cos@a_1D \cos@q_4D \cos@q_5D^2 \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_4D \sin@q_6D + \\
& a_1 a_5 \cos@a_4D \cos@q_1D \cos@q_2D \cos@q_5D \sin@a_1D \\
& \sin@a_2D \sin@a_5D \sin@a_6D \sin@q_1D \sin@q_5D \sin@q_6D - \\
& a_5^2 \cos@a_4D \cos@q_2D \cos@q_5D^2 \sin@a_1D \sin@a_2D \sin@a_5D \sin@a_6D \sin@q_1D \sin@q_5D \sin@q_6D - \\
& a_1 a_5 \cos@a_2D \cos@q_1D \cos@q_4D \cos@q_5D \sin@a_1D \\
& \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_1D \sin@q_5D \sin@q_6D + \\
& a_5^2 \cos@a_2D \cos@q_4D \cos@q_5D^2 \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_1D \sin@q_5D \sin@q_6D - \\
& a_2 a_5 \cos@a_4D \cos@q_1D \cos@q_2D \cos@q_5D \sin@a_1D \\
& \sin@a_2D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D \sin@q_6D + \\
& a_5^2 \cos@a_4D \cos@q_1D \cos@q_5D^2 \sin@a_1D \sin@a_2D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D \sin@q_6D + \\
& a_2 a_5 \cos@a_1D \cos@q_2D \cos@q_4D \cos@q_5D \sin@a_2D \\
& \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D \sin@q_6D - \\
& a_5^2 \cos@a_1D \cos@q_4D \cos@q_5D^2 \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D \sin@q_6D + \\
& a_4 a_5 \cos@a_2D \cos@q_1D \cos@q_4D \cos@q_5D \sin@a_1D \\
& \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - \\
& a_5^2 \cos@a_2D \cos@q_1D \cos@q_5D^2 \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - \\
& a_4 a_5 \cos@a_1D \cos@q_2D \cos@q_4D \cos@q_5D \sin@a_2D \\
& \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D + \\
& a_5^2 \cos@a_1D \cos@q_2D \cos@q_5D^2 \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6DL' \\
\text{H- } & a_1 a_5 d_4 \cos@a_4D^2 \cos@q_1D \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_3D \sin@a_6D \\
& \sin@q_1D \sin@q_2D \sin@q_5D + a_1 a_5 d_6 \cos@a_4D^2 \cos@q_1D \cos@q_3D \cos@q_6D \sin@a_1D \\
& \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_5D + a_1 a_5 d_5 \cos@a_4D \cos@a_5D \\
& \cos@q_1D \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_5D - \\
& a_1 a_5 d_6 \cos@a_4D \cos@a_5D \cos@q_1D \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_3D \\
& \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_5D + a_2 a_5 d_4 \cos@a_4D^2 \cos@q_2D \cos@q_3D \\
& \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_5D - \\
& a_2 a_5 d_6 \cos@a_4D^2 \cos@q_2D \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_3D \sin@a_6D \\
& \sin@q_1D \sin@q_2D \sin@q_5D - a_2 a_5 d_5 \cos@a_4D \cos@a_5D \cos@q_2D \cos@q_3D \\
& \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_5D + \\
& a_2 a_5 d_6 \cos@a_4D \cos@a_5D \cos@q_2D \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_3D \\
& \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_5D + a_1 a_5 d_3 \cos@a_3D \cos@a_4D \cos@q_1D \\
& \cos@q_4D \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_4D \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_5D -
\end{aligned}$$

[illegible]

[illegible]

[illegible]



[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q5D^2 - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D
\end{aligned}$$

$$\begin{aligned}
& \cos q_6 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_5 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_5^2 d_1 \cos a_1 \cos a_2 \cos q_3 \cos q_5 \\
& \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_5^2 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_5 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_1 a_5 d_4 \cos a_4^2 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_6 \cos a_4^2 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_1 \sin q_2 \sin q_6 - a_1 a_5 d_5 \cos a_4 \cos a_5 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_1 a_5 d_6 \cos a_4 \cos a_5 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_4 \cos a_4^2 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_2 a_5 d_6 \cos a_4^2 \cos q_2 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_1 \sin q_2 \sin q_6 + a_2 a_5 d_5 \cos a_4 \cos a_5 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_2 a_5 d_6 \cos a_4 \cos a_5 \cos q_2 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_1 a_5 d_6 \cos a_3 \cos a_4 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_1 a_5 d_5 \cos a_3 \cos a_5 \cos q_1 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_6 \cos a_3 \cos a_5 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_2 a_5 d_6 \cos a_3 \cos a_4 \cos q_2 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_5 \cos a_3 \cos a_5 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_2 a_5 d_6 \cos a_3 \cos a_5 \cos q_2 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_1 a_5 d_4 \cos a_4^2 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_3 \sin q_6 + \\
& a_1 a_5 d_6 \cos a_4^2 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_1 \sin q_3 \sin q_6 + a_1 a_5 d_5 \cos a_4 \cos a_5 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_3 \sin q_6 - \\
& a_1 a_5 d_6 \cos a_4 \cos a_5 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_3 \sin q_6 + a_3 a_5 d_4 \cos a_4^2 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_3 \sin q_6 -
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6DL, \\
& Ha1 a6 d5 \cos@a4D \cos@a6D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a1 a6 d6 \cos@a4D \cos@a6D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a1 a6 d5 \cos@a5D \cos@a6D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a1 a6 d6 \cos@a5D \cos@a6D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a2 a6 d5 \cos@a4D \cos@a6D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a2 a6 d6 \cos@a4D \cos@a6D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a2 a6 d5 \cos@a5D \cos@a6D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a2 a6 d6 \cos@a5D \cos@a6D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a1 a6 d4 \cos@a4D \cos@a6D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D - \\
& a1 a6 d5 \cos@a4D \cos@a6D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D - \\
& a2 a6 d4 \cos@a4D \cos@a6D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D + \\
& a2 a6 d5 \cos@a4D \cos@a6D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D - \\
& a1 a6 d4 \cos@a4D^2 \cos@q1D \cos@q6D^2 \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D + \\
& a1 a6 d6 \cos@a4D^2 \cos@q1D \cos@q6D^2 \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D + \\
& a1 a6 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q6D^2 \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D - \\
& a1 a6 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q6D^2 \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D +
\end{aligned}$$



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



$$\begin{aligned}
& \text{Sin@a6D Sin@q3D Sin@q4D Sin@q5D} + \text{a4 a5 d2 Cos@a4D Cos@q1D} \\
& \text{Cos@q4D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D} - \\
& \text{a4 a5 d6 Cos@a2D Cos@a4D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q3D Sin@q4D Sin@q5D} - \text{a4 a5 d5 Cos@a2D Cos@a5D Cos@q1D} \\
& \text{Cos@q4D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D} + \\
& \text{a4 a5 d6 Cos@a2D Cos@a5D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q3D Sin@q4D Sin@q5D} + \text{a3 a5 d1 Cos@a1D Cos@a4D Cos@q2D} \\
& \text{Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D} \\
& \text{a3 a5 d6 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q3D Sin@q4D Sin@q5D} - \text{a3 a5 d5 Cos@a1D Cos@a5D Cos@q2D} \\
& \text{Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D} + \\
& \text{a3 a5 d6 Cos@a1D Cos@a5D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q3D Sin@q4D Sin@q5D} - \text{a4 a5 d1 Cos@a1D Cos@a4D Cos@q2D} \\
& \text{Cos@q4D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D} + \\
& \text{a4 a5 d6 Cos@a1D Cos@a4D Cos@q2D Cos@q4D Cos@q6D Sin@a2D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q3D Sin@q4D Sin@q5D} + \text{a4 a5 d5 Cos@a1D Cos@a5D Cos@q2D} \\
& \text{Cos@q4D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D} - \\
& \text{a4 a5 d6 Cos@a1D Cos@a5D Cos@q2D Cos@q4D Cos@q6D Sin@a2D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q3D Sin@q4D Sin@q5D} - \text{a3 a5 d1 Cos@a1D Cos@a2D Cos@q3D} \\
& \text{Cos@q5D Cos@q6D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q5D} + \\
& \text{a3 a5 d2 Cos@a1D Cos@a2D Cos@q3D Cos@q5D Cos@q6D Sin@a3D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q3D Sin@q4D Sin@q5D} + \text{a4 a5 d1 Cos@a1D Cos@a2D Cos@q4D} \\
& \text{Cos@q5D Cos@q6D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q5D} - \\
& \text{a4 a5 d2 Cos@a1D Cos@a2D Cos@q4D Cos@q5D Cos@q6D Sin@a3D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q3D Sin@q4D Sin@q5D} + \text{a1 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\
& \text{Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 - \\
& \text{a1 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 - \text{a5}^2 \text{d3 Cos@a3D Cos@a4D Cos@q2D Cos@q5D} \\
& \text{Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 + \\
& \text{a5}^2 \text{d4 Cos@a3D Cos@a4D Cos@q2D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 - \text{a1 a5 d2 Cos@a2D Cos@a4D Cos@q1D} \\
& \text{Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 + \\
& \text{a1 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 + \text{a5}^2 \text{d2 Cos@a2D Cos@a4D Cos@q3D Cos@q5D} \\
& \text{Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 - \\
& \text{a5}^2 \text{d4 Cos@a2D Cos@a4D Cos@q3D Cos@q5D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 + \text{a1 a5 d2 Cos@a2D Cos@a3D Cos@q1D} \\
& \text{Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 - \\
& \text{a1 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 - \text{a5}^2 \text{d2 Cos@a2D Cos@a3D Cos@q4D Cos@q5D} \\
& \text{Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 + \\
& \text{a5}^2 \text{d3 Cos@a2D Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 - \text{a2 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\
& \text{Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \\
& \text{a2 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 + \text{a5}^2 \text{d3 Cos@a3D Cos@a4D Cos@q1D Cos@q5D}
\end{aligned}$$

$$\begin{aligned}
& \cos q_6 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5^2 - \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5^2 + a_2 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \\
& \cos q_3 \cos q_6 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5^2 - \\
& a_2 a_5 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_6 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5^2 - a_5^2 d_1 \cos a_1 \cos a_4 \cos q_3 \cos q_5 \\
& \cos q_6 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5^2 + \\
& a_5^2 d_4 \cos a_1 \cos a_4 \cos q_3 \cos q_5 \cos q_6 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5^2 - a_2 a_5 d_1 \cos a_1 \cos a_3 \cos q_2 \\
& \cos q_4 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5^2 + \\
& a_2 a_5 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5^2 + a_5^2 d_1 \cos a_1 \cos a_3 \cos q_4 \cos q_5 \\
& \cos q_6 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5^2 - \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_4 \cos q_5 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5^2 + a_3 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \\
& \cos q_3 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 - \\
& a_3 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5^2 - a_5^2 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_5 \\
& \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 + \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5^2 - a_3 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \\
& \cos q_3 \cos q_6 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 + \\
& a_3 a_5 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_6 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5^2 + a_5^2 d_1 \cos a_1 \cos a_4 \cos q_2 \cos q_5 \\
& \cos q_6 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 - \\
& a_5^2 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_5 \cos q_6 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5^2 + a_3 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 - \\
& a_3 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5^2 - a_5^2 d_1 \cos a_1 \cos a_2 \cos q_4 \cos q_5 \\
& \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 + \\
& a_5^2 d_2 \cos a_1 \cos a_2 \cos q_4 \cos q_5 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5^2 - a_4 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \\
& \cos q_4 \cos q_6 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_4 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_6 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_5^2 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_5 \\
& \cos q_6 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_4 a_5 d_1 \cos a_1 \cos a_3 \cos q_2 \\
& \cos q_4 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_4 a_5 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 - a_5^2 d_1 \cos a_1 \cos a_3 \cos q_2 \cos q_5 \\
& \cos q_6 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_5 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 +
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& a2 a6 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q6D^2 + \\
& a2 a6 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q6D^2 + \\
& a5 a6 d1 \cos@a1D \cos@a4D \cos@q5D^2 \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q6D^2 - \\
& a5 a6 d4 \cos@a1D \cos@a4D \cos@q5D^2 \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q6D^2 + \\
& a4 a6 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q4D \sin@a1D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 - \\
& a4 a6 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q4D \sin@a1D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 - \\
& a4 a6 d5 \cos@a2D \cos@a5D \cos@q1D \cos@q4D \sin@a1D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 + \\
& a4 a6 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q4D \sin@a1D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 - \\
& a5 a6 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \sin@a1D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 + \\
& a5 a6 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \sin@a1D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 + \\
& a5 a6 d5 \cos@a2D \cos@a5D \cos@q1D \cos@q5D \sin@a1D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 - \\
& a5 a6 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q5D \sin@a1D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 - \\
& a4 a6 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \sin@a2D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 + \\
& a4 a6 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \sin@a2D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 + \\
& a4 a6 d5 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \sin@a2D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 - \\
& a4 a6 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \sin@a2D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 + \\
& a5 a6 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \sin@a2D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 - \\
& a5 a6 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \sin@a2D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 - \\
& a5 a6 d5 \cos@a1D \cos@a5D \cos@q2D \cos@q5D \sin@a2D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 + \\
& a5 a6 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q5D \sin@a2D \sin@a4D \sin@a6D \sin@q4D \sin@q6D^2 + \\
& a4 a6 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q6D^2 - \\
& a4 a6 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q6D^2 - \\
& a5 a6 d1 \cos@a1D \cos@a2D \cos@q5D^2 \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q6D^2 + \\
& a5 a6 d2 \cos@a1D \cos@a2D \cos@q5D^2 \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q6D^2 L' \\
\text{H- } & a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d5 \cos@a4D \cos@a5D \\
& \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D -
\end{aligned}$$

[illegible]

[illegible]





[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D
\end{aligned}$$

[illegible]

[illegible]

[illegible]



$$\begin{aligned}
& a^5 d_4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a_1 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a_1 a_5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a^5 d_2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^5 d_4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D - a_1 a_5 d_2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a_1 a_5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a^5 d_2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^5 d_3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a_2 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a_2 a_5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a_2 a_5 d_1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a_2 a_5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a^5 d_1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^5 d_4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a_2 a_5 d_1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a_2 a_5 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d_1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d_3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a_3 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a_3 a_5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d_2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a_3 a_5 d_1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a_3 a_5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^5 d_1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a_3 a_5 d_1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a_3 a_5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6DL, \\
H- & a1 a5 d5 \cos@a5D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a1 a5 d6 \cos@a5D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d5 \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a1 a5 d4 \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a2 a5 d4 \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a1 a5 d5 \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D - \\
& a1 a5 d6 \cos@a5D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q5D - a4 a5 d5 \cos@a5D \cos@q2D \cos@q4D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D + \\
& a4 a5 d6 \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q5D - a1 a5 d2 \cos@a2D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q5D + \\
& a1 a5 d6 \cos@a2D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q5D + a4 a5 d2 \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q5D - \\
& a4 a5 d6 \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q5D - a2 a5 d5 \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q5D +
\end{aligned}$$



[illegible]

[illegible]

$$\begin{aligned}
& a^5 d_6 \cos@a1D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^4 a_5 d_2 \cos@a2D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^4 a_5 d_6 \cos@a2D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5 d_2 \cos@a2D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5 d_6 \cos@a2D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a_5 d_1 \cos@a1D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^4 a_5 d_6 \cos@a1D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5 d_1 \cos@a1D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5 d_6 \cos@a1D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \\
& \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D ' \\
\text{H- } & a_1 a_5 d_4 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a_1 a_5 d_6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a_1 a_5 d_5 \cos@a4D \cos@a5D \\
& \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a_1 a_5 d_6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a_2 a_5 d_4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a_2 a_5 d_6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a_2 a_5 d_5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a_2 a_5 d_6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a_1 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a_1 a_5 d_6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a_1 a_5 d_5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a_1 a_5 d_6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a_2 a_5 d_3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a_2 a_5 d_6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a_2 a_5 d_5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a_2 a_5 d_6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a_1 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a_1 a_5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a_2 a_5 d_3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a_2 a_5 d_4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a_1 a_5 d_4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a_1 a_5 d_6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D - a_1 a_5 d_5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D +
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& a_4 a_5 d_6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D - a_3 a_5 d_1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a_3 a_5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a_4 a_5 d_1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a_4 a_5 d_2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a_1 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a_1 a_5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_5^2 d_3 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a_5^2 d_4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_1 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a_1 a_5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a_5^2 d_2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a_5^2 d_4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a_1 a_5 d_2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a_1 a_5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_5^2 d_2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a_5^2 d_3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_2 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a_2 a_5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_5^2 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a_5^2 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_2 a_5 d_1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a_2 a_5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a_5^2 d_1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a_5^2 d_4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a_2 a_5 d_1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a_2 a_5 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_5^2 d_1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a_5^2 d_3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_3 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a_3 a_5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D
\end{aligned}$$



[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& a^5 d^3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a^2 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^2 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^2 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a^2 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d^3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^3 a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^3 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^3 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a^3 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d^2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^4 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a^4 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^4 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D
\end{aligned}$$

[illegible]

[illegible]

[illegible]





[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

$a_1 a_5 d_4 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} + a_5^2 d_3 \text{Cos@a3D Cos@a4D Cos@q2D Cos@q5D}^2 \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} + a_1 a_5 d_2 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} - a_1 a_5 d_4 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} - a_5^2 d_2 \text{Cos@a2D Cos@a4D Cos@q3D Cos@q5D}^2 \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} + a_5^2 d_4 \text{Cos@a2D Cos@a4D Cos@q3D Cos@q5D}^2 \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} - a_1 a_5 d_2 \text{Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} + a_5^2 d_2 \text{Cos@a2D Cos@a3D Cos@q4D Cos@q5D}^2 \text{Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} - a_5^2 d_3 \text{Cos@a2D Cos@a3D Cos@q4D Cos@q5D}^2 \text{Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} + a_2 a_5 d_3 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} - a_2 a_5 d_4 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} - a_5^2 d_3 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q5D}^2 \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} + a_5^2 d_4 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q5D}^2 \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} - a_2 a_5 d_1 \text{Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} + a_2 a_5 d_4 \text{Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} + a_5^2 d_1 \text{Cos@a1D Cos@a4D Cos@q3D Cos@q5D}^2 \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} - a_5^2 d_4 \text{Cos@a1D Cos@a4D Cos@q3D Cos@q5D}^2 \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} + a_2 a_5 d_1 \text{Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q5D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} - a_5^2 d_1 \text{Cos@a1D Cos@a3D Cos@q4D Cos@q5D}^2 \text{Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} + a_5^2 d_3 \text{Cos@a1D Cos@a3D Cos@q4D Cos@q5D}^2 \text{Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} - a_3 a_5 d_2 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D} + a_3 a_5 d_4 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D} + a_5^2 d_2 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q5D}^2 \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D} - a_5^2 d_4 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q5D}^2 \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D} + a_3 a_5 d_1 \text{Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D} - a_5^2 d_1 \text{Cos@a1D Cos@a4D Cos@q2D Cos@q5D}^2 \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D} + a_5^2 d_4 \text{Cos@a1D Cos@a4D Cos@q2D Cos@q5D}^2 \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D}$

$$\begin{aligned}
& \sin@q3D \sin@q5D \sin@q6D - a^3 a^5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^4 a^5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a^4 a^5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^4 a^5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a^4 a^5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D, \\
& Ha1 d5 \cos@a4D \cos@a6D \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D - \\
& a1 d6 \cos@a4D \cos@a6D \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D - \\
& a1 d5 \cos@a5D \cos@a6D \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a1 d6 \cos@a5D \cos@a6D \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D - \\
& a2 d5 \cos@a4D \cos@a6D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a2 d6 \cos@a4D \cos@a6D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a2 d5 \cos@a5D \cos@a6D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D - \\
& a2 d6 \cos@a5D \cos@a6D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a1 d3 \cos@a3D \cos@a6D \cos@q1D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D - \\
& a1 d5 \cos@a3D \cos@a6D \cos@q1D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D - \\
& a2 d3 \cos@a3D \cos@a6D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D + \\
& a2 d5 \cos@a3D \cos@a6D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D - \\
& a1 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D + \\
& a1 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D + \\
& a1 d5 \cos@a3D \cos@a5D \cos@q1D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D - \\
& a1 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D + \\
& a2 d3 \cos@a3D \cos@a4D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D - \\
& a2 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D - \\
& a2 d5 \cos@a3D \cos@a5D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D + \\
& a2 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D - \\
& a1 d5 \cos@a4D \cos@a6D \cos@q1D \cos@q2D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D + \\
& a1 d6 \cos@a4D \cos@a6D \cos@q1D \cos@q2D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D +
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]



$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q3D \sin@q5D - a3 a5 d5 \cos@a2D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a3 a5 d6 \cos@a2D \cos@a5D \cos@q3D \cos@q4D \cos@q6D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q5D + a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q5D - a3 a5 d2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q5D - a2 a5 d4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q5D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q2D \sin@q3D \sin@q5D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q5D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q5D + a3 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q5D - \\
& a3 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q2D \sin@q3D \sin@q5D - a3 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q5D + \\
& a3 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q5D + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q5D - \\
& a2 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q5D - a2 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q5D + \\
& a2 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q5D - a3 a5 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q5D + \\
& a3 a5 d6 \cos@a1D \cos@a4D \cos@q3D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q5D + a3 a5 d5 \cos@a1D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q5D - \\
& a3 a5 d6 \cos@a1D \cos@a5D \cos@q3D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q5D - a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q5D + \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q5D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q5D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q5D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q5D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q5D + a4 a5 d3 \cos@a3D \cos@a4D \cos@q2D
\end{aligned}$$

[illegible]

$\begin{aligned} & \sin@a5d6\cos@a1D\cos@a5D\cos@q3D\cos@q4D\cos@q6D\sin@a3D\sin@a4D \\ & \sin@a6D\sin@q2D\sin@q4D\sin@q5D + a2a5d1\cos@a1D\cos@a3D\cos@q2D \\ & \cos@q5D\cos@q6D\sin@a2D\sin@a4D\sin@a5D\sin@a6D\sin@q2D\sin@q4D\sin@q5D - \\ & a2a5d3\cos@a1D\cos@a3D\cos@q2D\cos@q5D\cos@q6D\sin@a2D\sin@a4D\sin@a5D \\ & \sin@a6D\sin@q2D\sin@q4D\sin@q5D - a4a5d1\cos@a1D\cos@a3D\cos@q4D \\ & \cos@q5D\cos@q6D\sin@a2D\sin@a4D\sin@a5D\sin@a6D\sin@q2D\sin@q4D\sin@q5D + \\ & a4a5d3\cos@a1D\cos@a3D\cos@q4D\cos@q5D\cos@q6D\sin@a2D\sin@a4D\sin@a5D \\ & \sin@a6D\sin@q2D\sin@q4D\sin@q5D - a3a5d2\cos@a2D\cos@a4D\cos@q1D \\ & \cos@q3D\cos@q6D\sin@a1D\sin@a3D\sin@a4D\sin@a6D\sin@q3D\sin@q4D\sin@q5D + \\ & a3a5d6\cos@a2D\cos@a4D\cos@q1D\cos@q3D\cos@q6D\sin@a1D\sin@a3D\sin@a4D \\ & \sin@a6D\sin@q3D\sin@q4D\sin@q5D + a3a5d5\cos@a2D\cos@a5D\cos@q1D \\ & \cos@q3D\cos@q6D\sin@a1D\sin@a3D\sin@a4D\sin@a6D\sin@q3D\sin@q4D\sin@q5D - \\ & a3a5d6\cos@a2D\cos@a5D\cos@q1D\cos@q3D\cos@q6D\sin@a1D\sin@a3D\sin@a4D \\ & \sin@a6D\sin@q3D\sin@q4D\sin@q5D + a4a5d2\cos@a2D\cos@a4D\cos@q1D \\ & \cos@q4D\cos@q6D\sin@a1D\sin@a3D\sin@a4D\sin@a6D\sin@q3D\sin@q4D\sin@q5D - \\ & a4a5d6\cos@a2D\cos@a4D\cos@q1D\cos@q4D\cos@q6D\sin@a1D\sin@a3D\sin@a4D \\ & \sin@a6D\sin@q3D\sin@q4D\sin@q5D - a4a5d5\cos@a2D\cos@a5D\cos@q1D \\ & \cos@q4D\cos@q6D\sin@a1D\sin@a3D\sin@a4D\sin@a6D\sin@q3D\sin@q4D\sin@q5D + \\ & a4a5d6\cos@a2D\cos@a5D\cos@q1D\cos@q4D\cos@q6D\sin@a1D\sin@a3D\sin@a4D \\ & \sin@a6D\sin@q3D\sin@q4D\sin@q5D + a3a5d1\cos@a1D\cos@a4D\cos@q2D \\ & \cos@q3D\cos@q6D\sin@a2D\sin@a3D\sin@a4D\sin@a6D\sin@q3D\sin@q4D\sin@q5D - \\ & a3a5d6\cos@a1D\cos@a4D\cos@q2D\cos@q3D\cos@q6D\sin@a2D\sin@a3D\sin@a4D \\ & \sin@a6D\sin@q3D\sin@q4D\sin@q5D - a3a5d5\cos@a1D\cos@a5D\cos@q2D \\ & \cos@q3D\cos@q6D\sin@a2D\sin@a3D\sin@a4D\sin@a6D\sin@q3D\sin@q4D\sin@q5D + \\ & a3a5d6\cos@a1D\cos@a5D\cos@q2D\cos@q3D\cos@q6D\sin@a2D\sin@a3D\sin@a4D \\ & \sin@a6D\sin@q3D\sin@q4D\sin@q5D - a4a5d1\cos@a1D\cos@a4D\cos@q2D \\ & \cos@q4D\cos@q6D\sin@a2D\sin@a3D\sin@a4D\sin@a6D\sin@q3D\sin@q4D\sin@q5D + \\ & a4a5d6\cos@a1D\cos@a4D\cos@q2D\cos@q4D\cos@q6D\sin@a2D\sin@a3D\sin@a4D \\ & \sin@a6D\sin@q3D\sin@q4D\sin@q5D + a4a5d5\cos@a1D\cos@a5D\cos@q2D \\ & \cos@q4D\cos@q6D\sin@a2D\sin@a3D\sin@a4D\sin@a6D\sin@q3D\sin@q4D\sin@q5D - \\ & a4a5d6\cos@a1D\cos@a5D\cos@q2D\cos@q4D\cos@q6D\sin@a2D\sin@a3D\sin@a4D \\ & \sin@a6D\sin@q3D\sin@q4D\sin@q5D - a3a5d1\cos@a1D\cos@a2D\cos@q3D \\ & \cos@q5D\cos@q6D\sin@a3D\sin@a4D\sin@a5D\sin@a6D\sin@q3D\sin@q4D\sin@q5D + \\ & a3a5d2\cos@a1D\cos@a2D\cos@q3D\cos@q5D\cos@q6D\sin@a3D\sin@a4D\sin@a5D \\ & \sin@a6D\sin@q3D\sin@q4D\sin@q5D + a4a5d1\cos@a1D\cos@a2D\cos@q4D \\ & \cos@q5D\cos@q6D\sin@a3D\sin@a4D\sin@a5D\sin@a6D\sin@q3D\sin@q4D\sin@q5D - \\ & a4a5d2\cos@a1D\cos@a2D\cos@q4D\cos@q5D\cos@q6D\sin@a3D\sin@a4D\sin@a5D \\ & \sin@a6D\sin@q3D\sin@q4D\sin@q5D + a1a5d3\cos@a3D\cos@a4D\cos@q1D \\ & \cos@q2D\cos@q6D\sin@a1D\sin@a2D\sin@a5D\sin@a6D\sin@q1D\sin@q5D^2 - \\ & a1a5d4\cos@a3D\cos@a4D\cos@q1D\cos@q2D\cos@q6D\sin@a1D\sin@a2D\sin@a5D \\ & \sin@a6D\sin@q1D\sin@q5D^2 - a5^2d3\cos@a3D\cos@a4D\cos@q2D\cos@q5D \\ & \cos@q6D\sin@a1D\sin@a2D\sin@a5D\sin@a6D\sin@q1D\sin@q5D^2 + \\ & a5^2d4\cos@a3D\cos@a4D\cos@q2D\cos@q5D\cos@q6D\sin@a1D\sin@a2D\sin@a5D \\ & \sin@a6D\sin@q1D\sin@q5D^2 - a1a5d2\cos@a2D\cos@a4D\cos@q1D \\ & \cos@q3D\cos@q6D\sin@a1D\sin@a3D\sin@a5D\sin@a6D\sin@q1D\sin@q5D^2 + \\ & a1a5d4\cos@a2D\cos@a4D\cos@q1D\cos@q3D\cos@q6D\sin@a1D\sin@a3D\sin@a5D \end{aligned}$

$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D
\end{aligned}$$

$$\begin{aligned}
& \cos q_4 \cos q_6 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_4 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_6 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_5^2 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_5 \\
& \cos q_6 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_4 a_5 d_1 \cos a_1 \cos a_3 \cos q_2 \\
& \cos q_4 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_4 a_5 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 - a_5^2 d_1 \cos a_1 \cos a_3 \cos q_2 \cos q_5 \\
& \cos q_6 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_5 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_5^2 d_1 \cos a_1 \cos a_2 \cos q_3 \cos q_5 \\
& \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_5^2 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_5 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_1 a_5 d_4 \cos a_4^2 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_6 \cos a_4^2 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_1 \sin q_2 \sin q_6 - a_1 a_5 d_5 \cos a_4 \cos a_5 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_1 a_5 d_6 \cos a_4 \cos a_5 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_4 \cos a_4^2 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_2 a_5 d_6 \cos a_4^2 \cos q_2 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_1 \sin q_2 \sin q_6 + a_2 a_5 d_5 \cos a_4 \cos a_5 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_2 a_5 d_6 \cos a_4 \cos a_5 \cos q_2 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_1 a_5 d_6 \cos a_3 \cos a_4 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_1 a_5 d_5 \cos a_3 \cos a_5 \cos q_1 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_6 \cos a_3 \cos a_5 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_2 a_5 d_6 \cos a_3 \cos a_4 \cos q_2 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_5 \cos a_3 \cos a_5 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_2 a_5 d_6 \cos a_3 \cos a_5 \cos q_2 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_2 \sin q_6 +
\end{aligned}$$

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D + a2 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a2 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a3 a5 d6 \cos@a1D \cos@a4D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D - a3 a5 d5 \cos@a1D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q6D + \\
& a3 a5 d6 \cos@a1D \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q6D + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q3D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D + a4 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a1 a5 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D + a1 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\
& \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a1 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a2D \cos@a4D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a2D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a2D \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q6D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D
\end{aligned}$$

[illegible]



$$\begin{aligned}
& a^3 a^5 d^6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a^4 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a^4 a^5 d^6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a^4 a^5 d^5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a^4 a^5 d^6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a^3 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a^3 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a^4 a^5 d^1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a^4 a^5 d^2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D - a^1 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^1 a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a^5^2 d^3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^5^2 d^4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a^1 a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^1 a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a^5^2 d^2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^5^2 d^4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D - a^1 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^1 a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a^5^2 d^2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^5^2 d^3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a^2 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5^2 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5^2 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^2 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^2 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a^5^2 d^1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^5^2 d^4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a^2 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D, \\
& Ha1 a5 \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \\
& \sin@q2D \sin@q5D - a2 a5 \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \\
& \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a1 a5 \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a1 a5 \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + a3 a5 \cos@a4D \cos@q2D
\end{aligned}$$

$$\begin{aligned}
& \cos q_3 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_3 \sin q_5 + \\
& a_1 a_5 \cos a_2 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_3 \sin q_5 - a_3 a_5 \cos a_2 \cos q_3 \cos q_5 \cos q_6 \sin a_1 \\
& \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_3 \sin q_5 + a_2 a_5 \cos a_4 \cos q_1 \\
& \cos q_2 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_2 \sin q_3 \sin q_5 - \\
& a_3 a_5 \cos a_4 \cos q_1 \cos q_3 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_2 \sin q_3 \sin q_5 - a_2 a_5 \cos a_1 \cos q_2 \cos q_5 \cos q_6 \sin a_2 \\
& \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_3 \sin q_5 + a_3 a_5 \cos a_1 \cos q_3 \\
& \cos q_5 \cos q_6 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_3 \sin q_5 + \\
& a_1 a_5 \cos a_3 \cos q_1 \cos q_2 \cos q_6 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5^2 - \\
& a_5^2 \cos a_3 \cos q_2 \cos q_5 \cos q_6 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5^2 - \\
& a_1 a_5 \cos a_2 \cos q_1 \cos q_3 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5^2 + \\
& a_5^2 \cos a_2 \cos q_3 \cos q_5 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5^2 - \\
& a_2 a_5 \cos a_3 \cos q_1 \cos q_2 \cos q_6 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5^2 + \\
& a_5^2 \cos a_3 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5^2 + \\
& a_2 a_5 \cos a_1 \cos q_2 \cos q_3 \cos q_6 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5^2 - \\
& a_5^2 \cos a_1 \cos q_3 \cos q_5 \cos q_6 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5^2 + \\
& a_3 a_5 \cos a_2 \cos q_1 \cos q_3 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 - \\
& a_5^2 \cos a_2 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 - \\
& a_3 a_5 \cos a_1 \cos q_2 \cos q_3 \cos q_6 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 + \\
& a_5^2 \cos a_1 \cos q_2 \cos q_5 \cos q_6 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5^2 - \\
& a_1 a_5 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_2 a_5 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_1 a_5 \cos a_3 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_2 a_5 \cos a_3 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_1 a_5 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_3 \sin q_6 - a_3 a_5 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_3 \sin q_6 - \\
& a_1 a_5 \cos a_2 \cos q_1 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_3 \sin q_6 + \\
& a_3 a_5 \cos a_2 \cos q_3 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_3 \sin q_6 - \\
& a_2 a_5 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_2 \sin q_3 \sin q_6 + a_3 a_5 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_2 \sin q_3 \sin q_6 + \\
& a_2 a_5 \cos a_1 \cos q_2 \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_3 \sin q_6 - \\
& a_3 a_5 \cos a_1 \cos q_3 \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_3 \sin q_6 - \\
& a_1 a_5 \cos a_3 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \\
& \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_5^2 \cos a_3 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 \cos a_2 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \\
& \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 \cos a_2 \cos q_3 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_2 a_5 \cos a_3 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \\
& \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_5^2 \cos a_3 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 \cos a_1 \cos q_2 \cos q_3 \cos q_5 \sin a_2
\end{aligned}$$

$$\begin{aligned}
& \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 \cos@a1D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a3 a5 \cos@a2D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \\
& \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 \cos@a2D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 \cos@a1D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \\
& \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 \cos@a1D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D L' \\
H- & a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d5 \cos@a4D \cos@a5D \\
& \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q5D - a3 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a3 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d3 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D
\end{aligned}$$



$$\begin{aligned}
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D -
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D
\end{aligned}$$

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a5D \sin@a6D \sin@q5D \sin@q6D + \\
& a^5 a^6 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a5D \sin@a6D \sin@q5D \sin@q6D - \\
& a^5 a^6 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \\
& \sin@a3D \sin@a5D \sin@a6D \sin@q5D \sin@q6D L'
\end{aligned}$$

$$\begin{aligned}
H- & a^1 a^5 d^4 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a^1 a^5 d^6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^1 a^5 d^5 \cos@a4D \cos@a5D \\
& \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^1 a^5 d^6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^2 a^5 d^4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^2 a^5 d^6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a^2 a^5 d^5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^2 a^5 d^6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^1 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^1 a^5 d^6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a^1 a^5 d^5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^1 a^5 d^6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a^2 a^5 d^3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^2 a^5 d^6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^2 a^5 d^5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^2 a^5 d^6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a^1 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^1 a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^2 a^5 d^3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^2 a^5 d^4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a^1 a^5 d^4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a^1 a^5 d^6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D - a^1 a^5 d^5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a^1 a^5 d^6 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q5D - a^3 a^5 d^4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a^3 a^5 d^6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D + a^3 a^5 d^5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a^3 a^5 d^6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q5D - a^1 a^5 d^2 \cos@a2D \cos@a4D \cos@q1D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]



$$\begin{aligned}
& a^5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a_3 a_5 d_1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a_3 a_5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a^5 d_1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a^5 d_2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a_4 a_5 d_2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a_4 a_5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a^5 d_2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a^5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a_4 a_5 d_1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a_4 a_5 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a^5 d_1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a^5 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a_4 a_5 d_1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a_4 a_5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a^5 d_1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a^5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a_1 a_5 d_4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a_1 a_5 d_6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a_1 a_5 d_5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a_1 a_5 d_6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a_2 a_5 d_4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a_2 a_5 d_6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a_2 a_5 d_5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a_2 a_5 d_6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a_1 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a_1 a_5 d_6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a_1 a_5 d_5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a_1 a_5 d_6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a_2 a_5 d_3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a_2 a_5 d_6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D
\end{aligned}$$

$$\begin{aligned}
& \text{Sin@a1D Sin@q1D Sin@q2D Sin@q6D} - \text{a2 a5 d5 Cos@a3D Cos@a5D Cos@q2D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q6D} + \\
& \text{Cos@q4D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q6D} + \text{a2 a5 d6 Cos@a3D Cos@a5D Cos@q2D Cos@q4D Cos@q5D Sin@a1D Sin@a2D Sin@a4D} \\
& \text{Sin@a6D Sin@q1D Sin@q2D Sin@q6D} + \text{a1 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q5D}^2 \text{ Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q2D Sin@q6D} - \\
& \text{a1 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q5D}^2 \text{ Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q2D Sin@q6D} - \text{a2 a5 d3 Cos@a3D Cos@a4D Cos@q2D} \\
& \text{Cos@q5D}^2 \text{ Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q2D Sin@q6D} + \text{a2 a5 d4 Cos@a3D Cos@a4D Cos@q2D Cos@q5D}^2 \text{ Sin@a1D Sin@a2D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q2D Sin@q6D} - \text{a1 a5 d4 Cos@a4D}^2 \text{ Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} + \\
& \text{a1 a5 d6 Cos@a4D}^2 \text{ Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} + \text{a1 a5 d5 Cos@a4D Cos@a5D Cos@q1D Cos@q2D} \\
& \text{Cos@q5D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} - \text{a1 a5 d6 Cos@a4D Cos@a5D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a3D} \\
& \text{Sin@a6D Sin@q1D Sin@q3D Sin@q6D} + \text{a3 a5 d4 Cos@a4D}^2 \text{ Cos@q2D Cos@q3D Cos@q5D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} - \\
& \text{a3 a5 d6 Cos@a4D}^2 \text{ Cos@q2D Cos@q3D Cos@q5D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} - \text{a3 a5 d5 Cos@a4D Cos@a5D Cos@q2D Cos@q3D} \\
& \text{Cos@q5D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} + \text{a3 a5 d6 Cos@a4D Cos@a5D Cos@q2D Cos@q3D Cos@q5D Sin@a1D Sin@a2D Sin@a3D} \\
& \text{Sin@a6D Sin@q1D Sin@q3D Sin@q6D} + \text{a1 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} - \\
& \text{a1 a5 d6 Cos@a2D Cos@a4D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} - \text{a1 a5 d5 Cos@a2D Cos@a5D Cos@q1D} \\
& \text{Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} + \text{a1 a5 d6 Cos@a2D Cos@a5D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q1D Sin@q3D Sin@q6D} - \text{a3 a5 d2 Cos@a2D Cos@a4D Cos@q3D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} + \\
& \text{a3 a5 d6 Cos@a2D Cos@a4D Cos@q3D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} + \text{a3 a5 d5 Cos@a2D Cos@a5D Cos@q3D} \\
& \text{Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} - \text{a3 a5 d6 Cos@a2D Cos@a5D Cos@q3D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q1D Sin@q3D Sin@q6D} - \text{a1 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q5D}^2 \text{ Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} + \\
& \text{a1 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q5D}^2 \text{ Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} + \text{a3 a5 d2 Cos@a2D Cos@a4D Cos@q3D Cos@q5D}^2 \text{ Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} - \\
& \text{a3 a5 d4 Cos@a2D Cos@a4D Cos@q3D Cos@q5D}^2 \text{ Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q3D Sin@q6D} + \text{a2 a5 d4 Cos@a4D}^2 \text{ Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q2D Sin@q3D Sin@q6D} - \\
& \text{a2 a5 d5 Cos@a4D Cos@a5D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q2D Sin@q3D Sin@q6D} + \text{a2 a5 d6 Cos@a4D Cos@a5D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q2D Sin@q3D Sin@q6D} - \\
& \text{a3 a5 d4 Cos@a4D}^2 \text{ Cos@q1D Cos@q3D}
\end{aligned}$$

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a3 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a3 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a5^2 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D - a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D
\end{aligned}$$

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q5D^2 - a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D
\end{aligned}$$



$$\begin{aligned}
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D -
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& a^5 a^6 d_6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a^3 a^5 d_5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a^3 a^5 d_6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a^4 a^5 d_1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a^4 a^5 d_6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a^4 a^5 d_5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a^4 a^5 d_6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a^3 a^5 d_1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a^3 a^5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a^4 a^5 d_1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a^4 a^5 d_2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D - a^1 a^5 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^1 a^5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a^5 a^2 d_3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^5 a^2 d_4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a^1 a^5 d_2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^1 a^5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a^5 a^2 d_2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^5 a^2 d_4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D - a^1 a^5 d_2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^1 a^5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a^5 a^2 d_2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^5 a^2 d_3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a^2 a^5 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 a^2 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 a^2 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^2 a^5 d_1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^2 a^5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a^5 a^2 d_1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^5 a^2 d_4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D
\end{aligned}$$

$$\begin{aligned}
& \sin@q2D \sin@q5D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D, \\
& Ha1 a5 d5 \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a1 a5 d6 \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a2 a5 d5 \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D +
\end{aligned}$$

[illegible]

[illegible]



$$\begin{aligned}
& \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q6D + a3 a5 d6 \cos@a1D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a1 a5 d3 \cos@a3D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a1 a5 d6 \cos@a3D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a3D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d6 \cos@a3D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a1 a5 d2 \cos@a2D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a1 a5 d6 \cos@a2D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a2D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a5^2 d6 \cos@a2D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a2 a5 d3 \cos@a3D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a2 a5 d6 \cos@a3D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d6 \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d1 \cos@a1D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a2 a5 d6 \cos@a1D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d1 \cos@a1D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a5^2 d6 \cos@a1D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a3 a5 d2 \cos@a2D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a3 a5 d6 \cos@a2D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d2 \cos@a2D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d6 \cos@a2D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d1 \cos@a1D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a3 a5 d6 \cos@a1D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d1 \cos@a1D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d6 \cos@a1D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \\
& \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D \text{ ' } \\
\text{H- } & a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d5 \cos@a4D \cos@a5D \\
& \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D -
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q5D^2 - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D
\end{aligned}$$

$$\begin{aligned}
& \cos q_6 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_5 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_5^2 d_1 \cos a_1 \cos a_2 \cos q_3 \cos q_5 \\
& \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_5^2 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_5 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_1 a_5 d_4 \cos a_4^2 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_6 \cos a_4^2 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_1 \sin q_2 \sin q_6 - a_1 a_5 d_5 \cos a_4 \cos a_5 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_1 a_5 d_6 \cos a_4 \cos a_5 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_4 \cos a_4^2 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_2 a_5 d_6 \cos a_4^2 \cos q_2 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_1 \sin q_2 \sin q_6 + a_2 a_5 d_5 \cos a_4 \cos a_5 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_2 a_5 d_6 \cos a_4 \cos a_5 \cos q_2 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_1 a_5 d_6 \cos a_3 \cos a_4 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_1 a_5 d_5 \cos a_3 \cos a_5 \cos q_1 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_6 \cos a_3 \cos a_5 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_2 a_5 d_6 \cos a_3 \cos a_4 \cos q_2 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_5 \cos a_3 \cos a_5 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_2 a_5 d_6 \cos a_3 \cos a_5 \cos q_2 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_1 a_5 d_4 \cos a_4^2 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_3 \sin q_6 + \\
& a_1 a_5 d_6 \cos a_4^2 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_1 \sin q_3 \sin q_6 + a_1 a_5 d_5 \cos a_4 \cos a_5 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_3 \sin q_6 - \\
& a_1 a_5 d_6 \cos a_4 \cos a_5 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_3 \sin q_6 + a_3 a_5 d_4 \cos a_4^2 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_3 \sin q_6 -
\end{aligned}$$

[illegible]



[illegible]

[illegible]

$a_3 a_5 d_2 \text{Cos@a1D Cos@a2D Cos@q3D Cos@q5D}^2 \text{Sin@a3D Sin@a4D Sin@a5D}$   
 $\text{Sin@a6D Sin@q3D Sin@q4D Sin@q6D} - a_4 a_5 d_1 \text{Cos@a1D Cos@a2D Cos@q4D}$   
 $\text{Cos@q5D}^2 \text{Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q6D} +$   
 $a_4 a_5 d_2 \text{Cos@a1D Cos@a2D Cos@q4D Cos@q5D}^2 \text{Sin@a3D Sin@a4D Sin@a5D Sin@a6D}$   
 $\text{Sin@q3D Sin@q4D Sin@q6D} - a_1 a_5 d_3 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q2D}$   
 $\text{Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} +$   
 $a_1 a_5 d_4 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a5D}$   
 $\text{Sin@a6D Sin@q1D Sin@q5D Sin@q6D} + a_5^2 d_3 \text{Cos@a3D Cos@a4D Cos@q2D}$   
 $\text{Cos@q5D}^2 \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} -$   
 $a_5^2 d_4 \text{Cos@a3D Cos@a4D Cos@q2D Cos@q5D}^2 \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D}$   
 $\text{Sin@q1D Sin@q5D Sin@q6D} + a_1 a_5 d_2 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q3D}$   
 $\text{Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} -$   
 $a_1 a_5 d_4 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D}$   
 $\text{Sin@a6D Sin@q1D Sin@q5D Sin@q6D} - a_5^2 d_2 \text{Cos@a2D Cos@a4D Cos@q3D}$   
 $\text{Cos@q5D}^2 \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} +$   
 $a_5^2 d_4 \text{Cos@a2D Cos@a4D Cos@q3D Cos@q5D}^2 \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D}$   
 $\text{Sin@q1D Sin@q5D Sin@q6D} - a_1 a_5 d_2 \text{Cos@a2D Cos@a3D Cos@q1D Cos@q4D}$   
 $\text{Cos@q5D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} +$   
 $a_1 a_5 d_3 \text{Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a4D Sin@a5D}$   
 $\text{Sin@a6D Sin@q1D Sin@q5D Sin@q6D} + a_5^2 d_2 \text{Cos@a2D Cos@a3D Cos@q4D}$   
 $\text{Cos@q5D}^2 \text{Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D} -$   
 $a_5^2 d_3 \text{Cos@a2D Cos@a3D Cos@q4D Cos@q5D}^2 \text{Sin@a1D Sin@a4D Sin@a5D Sin@a6D}$   
 $\text{Sin@q1D Sin@q5D Sin@q6D} + a_2 a_5 d_3 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q2D}$   
 $\text{Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} -$   
 $a_2 a_5 d_4 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a5D}$   
 $\text{Sin@a6D Sin@q2D Sin@q5D Sin@q6D} - a_5^2 d_3 \text{Cos@a3D Cos@a4D Cos@q1D}$   
 $\text{Cos@q5D}^2 \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} +$   
 $a_5^2 d_4 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q5D}^2 \text{Sin@a1D Sin@a2D Sin@a5D Sin@a6D}$   
 $\text{Sin@q2D Sin@q5D Sin@q6D} - a_2 a_5 d_1 \text{Cos@a1D Cos@a4D Cos@q2D Cos@q3D}$   
 $\text{Cos@q5D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} +$   
 $a_2 a_5 d_4 \text{Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a5D}$   
 $\text{Sin@a6D Sin@q2D Sin@q5D Sin@q6D} + a_5^2 d_1 \text{Cos@a1D Cos@a4D Cos@q3D}$   
 $\text{Cos@q5D}^2 \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} -$   
 $a_5^2 d_4 \text{Cos@a1D Cos@a4D Cos@q3D Cos@q5D}^2 \text{Sin@a2D Sin@a3D Sin@a5D Sin@a6D}$   
 $\text{Sin@q2D Sin@q5D Sin@q6D} + a_2 a_5 d_1 \text{Cos@a1D Cos@a3D Cos@q2D Cos@q4D}$   
 $\text{Cos@q5D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} -$   
 $a_2 a_5 d_3 \text{Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q5D Sin@a2D Sin@a4D Sin@a5D}$   
 $\text{Sin@a6D Sin@q2D Sin@q5D Sin@q6D} - a_5^2 d_1 \text{Cos@a1D Cos@a3D Cos@q4D}$   
 $\text{Cos@q5D}^2 \text{Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D} +$   
 $a_5^2 d_3 \text{Cos@a1D Cos@a3D Cos@q4D Cos@q5D}^2 \text{Sin@a2D Sin@a4D Sin@a5D Sin@a6D}$   
 $\text{Sin@q2D Sin@q5D Sin@q6D} - a_3 a_5 d_2 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q3D}$   
 $\text{Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D} +$   
 $a_3 a_5 d_4 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D}$   
 $\text{Sin@a6D Sin@q3D Sin@q5D Sin@q6D} + a_5^2 d_2 \text{Cos@a2D Cos@a4D Cos@q1D}$   
 $\text{Cos@q5D}^2 \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D} -$   
 $a_5^2 d_4 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q5D}^2 \text{Sin@a1D Sin@a3D Sin@a5D Sin@a6D}$

$$\begin{aligned}
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D <, \\
& 8Ha1 d4 \cos@a4D \cos@a6D \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D - \\
& a1 d5 \cos@a4D \cos@a6D \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D - \\
& a2 d4 \cos@a4D \cos@a6D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a2 d5 \cos@a4D \cos@a6D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D - \\
& a1 d3 \cos@a3D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a1 d5 \cos@a3D \cos@a6D \cos@q1D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a2 d3 \cos@a3D \cos@a6D \cos@q2D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a2 d5 \cos@a3D \cos@a6D \cos@q2D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a1 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D - \\
& a1 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D - \\
& a2 d3 \cos@a3D \cos@a4D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D + \\
& a2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D - \\
& a1 d4 \cos@a4D \cos@a6D \cos@q1D \cos@q2D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D + \\
& a1 d5 \cos@a4D \cos@a6D \cos@q1D \cos@q2D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D + \\
& a3 d4 \cos@a4D \cos@a6D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D - \\
& a3 d5 \cos@a4D \cos@a6D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D +
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

$$\begin{aligned}
& a_4 a_5 d_6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D - a_3 a_5 d_1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a_3 a_5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a_4 a_5 d_1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a_4 a_5 d_2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a_1 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a_1 a_5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_5^2 d_3 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a_5^2 d_4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_1 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a_1 a_5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a_5^2 d_2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a_5^2 d_4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a_1 a_5 d_2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a_1 a_5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_5^2 d_2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a_5^2 d_3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a_2 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a_2 a_5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_5^2 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a_5^2 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_2 a_5 d_1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a_2 a_5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a_5^2 d_1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a_5^2 d_4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a_2 a_5 d_1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a_2 a_5 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_5^2 d_1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a_5^2 d_3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a_3 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a_3 a_5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]



$$\begin{aligned}
& a^5 d^3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a^2 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^2 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^2 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a^2 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d^3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^3 a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^3 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^3 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a^3 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d^2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^4 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a^4 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^4 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



$$\begin{aligned}
& a_1^5 d_3 \cos @a_2D \cos @a_3D \cos @q_1D \cos @q_4D \cos @q_6D \sin@a_1D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_1D \sin@q_5D^2 - a_5^2 d_2 \cos @a_2D \cos @a_3D \cos @q_4D \cos @q_5D \\
& \cos @q_6D \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_1D \sin@q_5D^2 + \\
& a_5^2 d_3 \cos @a_2D \cos @a_3D \cos @q_4D \cos @q_5D \cos @q_6D \sin@a_1D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_1D \sin@q_5D^2 - a_2 a_5 d_3 \cos @a_3D \cos @a_4D \cos @q_1D \\
& \cos @q_2D \cos @q_6D \sin@a_1D \sin@a_2D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 + \\
& a_2 a_5 d_4 \cos @a_3D \cos @a_4D \cos @q_1D \cos @q_2D \cos @q_6D \sin@a_1D \sin@a_2D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 + a_5^2 d_3 \cos @a_3D \cos @a_4D \cos @q_1D \cos @q_5D \\
& \cos @q_6D \sin@a_1D \sin@a_2D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 - \\
& a_5^2 d_4 \cos @a_3D \cos @a_4D \cos @q_1D \cos @q_5D \cos @q_6D \sin@a_1D \sin@a_2D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 + a_2 a_5 d_1 \cos@a_1D \cos@a_4D \cos@q_2D \\
& \cos@q_3D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 - \\
& a_2 a_5 d_4 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_3D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 - a_5^2 d_1 \cos@a_1D \cos@a_4D \cos@q_3D \cos@q_5D \\
& \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 + \\
& a_5^2 d_4 \cos@a_1D \cos@a_4D \cos@q_3D \cos@q_5D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 - a_2 a_5 d_1 \cos@a_1D \cos@a_3D \cos@q_2D \\
& \cos@q_4D \cos@q_6D \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 + \\
& a_2 a_5 d_3 \cos@a_1D \cos@a_3D \cos@q_2D \cos@q_4D \cos@q_6D \sin@a_2D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 + a_5^2 d_1 \cos@a_1D \cos@a_3D \cos@q_4D \cos@q_5D \\
& \cos@q_6D \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_2D \sin@q_5D^2 - \\
& a_5^2 d_3 \cos@a_1D \cos@a_3D \cos@q_4D \cos@q_5D \cos@q_6D \sin@a_2D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_2D \sin@q_5D^2 + a_3 a_5 d_2 \cos@a_2D \cos@a_4D \cos@q_1D \\
& \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 - \\
& a_3 a_5 d_4 \cos@a_2D \cos@a_4D \cos@q_1D \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 - a_5^2 d_2 \cos@a_2D \cos@a_4D \cos@q_1D \cos@q_5D \\
& \cos@q_6D \sin@a_1D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 + \\
& a_5^2 d_4 \cos@a_2D \cos@a_4D \cos@q_1D \cos@q_5D \cos@q_6D \sin@a_1D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 - a_3 a_5 d_1 \cos@a_1D \cos@a_4D \cos@q_2D \\
& \cos@q_3D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 + \\
& a_3 a_5 d_4 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_3D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 + a_5^2 d_1 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_5D \\
& \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 - \\
& a_5^2 d_4 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_5D \cos@q_6D \sin@a_2D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 + a_3 a_5 d_1 \cos@a_1D \cos@a_2D \cos@q_3D \\
& \cos@q_4D \cos@q_6D \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 - \\
& a_3 a_5 d_2 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_4D \cos@q_6D \sin@a_3D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 - a_5^2 d_1 \cos@a_1D \cos@a_2D \cos@q_4D \cos@q_5D \\
& \cos@q_6D \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D^2 + \\
& a_5^2 d_2 \cos@a_1D \cos@a_2D \cos@q_4D \cos@q_5D \cos@q_6D \sin@a_3D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D^2 - a_4 a_5 d_2 \cos@a_2D \cos@a_3D \cos@q_1D \\
& \cos@q_4D \cos@q_6D \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D^2 + \\
& a_4 a_5 d_3 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_4D \cos@q_6D \sin@a_1D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_4D \sin@q_5D^2 + a_5^2 d_2 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_5D \\
& \cos@q_6D \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D^2 - \\
& a_5^2 d_3 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_5D \cos@q_6D \sin@a_1D \sin@a_4D \sin@a_5D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q6D + a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_6 \cos a_1 \cos a_5 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_3 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_3 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_4 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_4 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_4 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_1 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 - a_5^2 d_2 \cos a_2 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_3 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 - a_1 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_3 \cos q_4 \\
& \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_4 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_2 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_2 a_5 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 + a_5^2 d_1 \cos a_1 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_1 \cos a_4 \cos q_3 \cos q_5^2 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 + a_2 a_5 d_1 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \\
& \cos q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_1 \cos a_1 \cos a_3 \cos q_4 \\
& \cos q_5^2 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_4 \cos q_5^2 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_3 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 +
\end{aligned}$$

$$\begin{aligned}
& a_3 a_5 d_4 \cos@a_2D \cos@a_4D \cos@q_1D \cos@q_3D \cos@q_5D \sin@a_1D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D + a_5^2 d_2 \cos@a_2D \cos@a_4D \cos@q_1D \\
& \cos@q_5D^2 \sin@a_1D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D - \\
& a_5^2 d_4 \cos@a_2D \cos@a_4D \cos@q_1D \cos@q_5D^2 \sin@a_1D \sin@a_3D \sin@a_5D \sin@a_6D \\
& \sin@q_3D \sin@q_5D \sin@q_6D + a_3 a_5 d_1 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_3D \\
& \cos@q_5D \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D - \\
& a_3 a_5 d_4 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_3D \cos@q_5D \sin@a_2D \sin@a_3D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D - a_5^2 d_1 \cos@a_1D \cos@a_4D \cos@q_2D \\
& \cos@q_5D^2 \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D + \\
& a_5^2 d_4 \cos@a_1D \cos@a_4D \cos@q_2D \cos@q_5D^2 \sin@a_2D \sin@a_3D \sin@a_5D \sin@a_6D \\
& \sin@q_3D \sin@q_5D \sin@q_6D - a_3 a_5 d_1 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_4D \\
& \cos@q_5D \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D + \\
& a_3 a_5 d_2 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_4D \cos@q_5D \sin@a_3D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D + a_5^2 d_1 \cos@a_1D \cos@a_2D \cos@q_4D \\
& \cos@q_5D^2 \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_3D \sin@q_5D \sin@q_6D - \\
& a_5^2 d_2 \cos@a_1D \cos@a_2D \cos@q_4D \cos@q_5D^2 \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \\
& \sin@q_3D \sin@q_5D \sin@q_6D + a_4 a_5 d_2 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_4D \\
& \cos@q_5D \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - \\
& a_4 a_5 d_3 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_4D \cos@q_5D \sin@a_1D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - a_5^2 d_2 \cos@a_2D \cos@a_3D \cos@q_1D \\
& \cos@q_5D^2 \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D + \\
& a_5^2 d_3 \cos@a_2D \cos@a_3D \cos@q_1D \cos@q_5D^2 \sin@a_1D \sin@a_4D \sin@a_5D \sin@a_6D \\
& \sin@q_4D \sin@q_5D \sin@q_6D - a_4 a_5 d_1 \cos@a_1D \cos@a_3D \cos@q_2D \cos@q_4D \\
& \cos@q_5D \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D + \\
& a_4 a_5 d_3 \cos@a_1D \cos@a_3D \cos@q_2D \cos@q_4D \cos@q_5D \sin@a_2D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D + a_5^2 d_1 \cos@a_1D \cos@a_3D \cos@q_2D \\
& \cos@q_5D^2 \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - \\
& a_5^2 d_3 \cos@a_1D \cos@a_3D \cos@q_2D \cos@q_5D^2 \sin@a_2D \sin@a_4D \sin@a_5D \sin@a_6D \\
& \sin@q_4D \sin@q_5D \sin@q_6D + a_4 a_5 d_1 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_4D \\
& \cos@q_5D \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - \\
& a_4 a_5 d_2 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_4D \cos@q_5D \sin@a_3D \sin@a_4D \sin@a_5D \\
& \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D - a_5^2 d_1 \cos@a_1D \cos@a_2D \cos@q_3D \cos@q_5D^2 \\
& \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D + a_5^2 d_2 \cos@a_1D \cos@a_2D \\
& \cos@q_3D \cos@q_5D^2 \sin@a_3D \sin@a_4D \sin@a_5D \sin@a_6D \sin@q_4D \sin@q_5D \sin@q_6D, \\
H- & a_1 a_5 \cos@a_4D \cos@q_1D \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_1D \\
& \sin@q_2D \sin@q_5D + a_2 a_5 \cos@a_4D \cos@q_2D \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_2D \\
& \sin@a_3D \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_5D + a_1 a_5 \cos@a_3D \cos@q_1D \cos@q_4D \\
& \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_4D \sin@a_6D \sin@q_1D \sin@q_2D \sin@q_5D - \\
& a_2 a_5 \cos@a_3D \cos@q_2D \cos@q_4D \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_4D \sin@a_6D \\
& \sin@q_1D \sin@q_2D \sin@q_5D + a_1 a_5 \cos@a_4D \cos@q_1D \cos@q_2D \cos@q_6D \sin@a_1D \\
& \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_1D \sin@q_3D \sin@q_5D - a_3 a_5 \cos@a_4D \cos@q_2D \\
& \cos@q_3D \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_1D \sin@q_3D \sin@q_5D - \\
& a_1 a_5 \cos@a_2D \cos@q_1D \cos@q_4D \cos@q_6D \sin@a_1D \sin@a_3D \sin@a_4D \sin@a_6D \\
& \sin@q_1D \sin@q_3D \sin@q_5D + a_3 a_5 \cos@a_2D \cos@q_3D \cos@q_4D \cos@q_6D \sin@a_1D \\
& \sin@a_3D \sin@a_4D \sin@a_6D \sin@q_1D \sin@q_3D \sin@q_5D - a_2 a_5 \cos@a_4D \cos@q_1D \\
& \cos@q_2D \cos@q_6D \sin@a_1D \sin@a_2D \sin@a_3D \sin@a_6D \sin@q_2D \sin@q_3D \sin@q_5D +
\end{aligned}$$

[illegible]



$$\begin{aligned}
& \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a3 a5 \cos@a2D \cos@q1D \\
& \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a4 a5 \cos@a2D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D - a3 a5 \cos@a1D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \\
& \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 \cos@a1D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6DL' \\
H- & a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q6D \sin@a1D \\
& \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d5 \cos@a4D \cos@a5D \\
& \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q5D + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q5D - a3 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a3 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D + a3 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D -
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& a_4 a_5 d_2 \text{Cos@a1D Cos@a2D Cos@a3D Cos@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q3D Sin@q4D Sin@q5D} + a_1 a_5 d_3 \text{Cos@a3D Cos@a4D Cos@q1D} \\
& \text{Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 - \\
& a_1 a_5 d_4 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 - a_5^2 d_3 \text{Cos@a3D Cos@a4D Cos@q2D Cos@q5D} \\
& \text{Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 + \\
& a_5^2 d_4 \text{Cos@a3D Cos@a4D Cos@q2D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 - a_1 a_5 d_2 \text{Cos@a2D Cos@a4D Cos@q1D} \\
& \text{Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 + \\
& a_1 a_5 d_4 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 + a_5^2 d_2 \text{Cos@a2D Cos@a4D Cos@q3D Cos@q5D} \\
& \text{Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 - \\
& a_5^2 d_4 \text{Cos@a2D Cos@a4D Cos@q3D Cos@q5D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 + a_1 a_5 d_2 \text{Cos@a2D Cos@a3D Cos@q1D} \\
& \text{Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 - \\
& a_1 a_5 d_3 \text{Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 - a_5^2 d_2 \text{Cos@a2D Cos@a3D Cos@q4D Cos@q5D} \\
& \text{Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D}^2 + \\
& a_5^2 d_3 \text{Cos@a2D Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q5D}^2 - a_2 a_5 d_3 \text{Cos@a3D Cos@a4D Cos@q1D} \\
& \text{Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \\
& a_2 a_5 d_4 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 + a_5^2 d_3 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q5D} \\
& \text{Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 - \\
& a_5^2 d_4 \text{Cos@a3D Cos@a4D Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 + a_2 a_5 d_1 \text{Cos@a1D Cos@a4D Cos@q2D} \\
& \text{Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 - \\
& a_2 a_5 d_4 \text{Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 - a_5^2 d_1 \text{Cos@a1D Cos@a4D Cos@q3D Cos@q5D} \\
& \text{Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \\
& a_5^2 d_4 \text{Cos@a1D Cos@a4D Cos@q3D Cos@q5D Cos@q6D Sin@a2D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 - a_2 a_5 d_1 \text{Cos@a1D Cos@a3D Cos@q2D} \\
& \text{Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 + \\
& a_2 a_5 d_3 \text{Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q6D Sin@a2D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 + a_5^2 d_1 \text{Cos@a1D Cos@a3D Cos@q4D Cos@q5D} \\
& \text{Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D}^2 - \\
& a_5^2 d_3 \text{Cos@a1D Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a2D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q5D}^2 + a_3 a_5 d_2 \text{Cos@a2D Cos@a4D Cos@q1D} \\
& \text{Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 - \\
& a_3 a_5 d_4 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q3D Sin@q5D}^2 - a_5^2 d_2 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q5D} \\
& \text{Cos@q6D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 + \\
& a_5^2 d_4 \text{Cos@a2D Cos@a4D Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a3D Sin@a5D} \\
& \text{Sin@a6D Sin@q3D Sin@q5D}^2 - a_3 a_5 d_1 \text{Cos@a1D Cos@a4D Cos@q2D} \\
& \text{Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D}^2 + \\
& a_3 a_5 d_4 \text{Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a5D}
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D
\end{aligned}$$

[illegible]

[illegible]



$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a2D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a2D \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q6D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a2 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a2 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a2 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a2 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a1D \cos@a4D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d5 \cos@a1D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a1D \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q6D + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a3 a5 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a3 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\
& \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a3 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d2 \cos@a2D \cos@a4D \cos@q1D
\end{aligned}$$

$$\begin{aligned}
& \cos q_4 \cos q_5 \sin a_1 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_6 \cos a_2 \cos a_4 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_4 a_5 d_5 \cos a_2 \cos a_5 \cos q_1 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_4 a_5 d_6 \cos a_2 \cos a_5 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_3 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \\
& \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_3 a_5 d_6 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_3 a_5 d_5 \cos a_1 \cos a_5 \cos q_2 \\
& \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_3 a_5 d_6 \cos a_1 \cos a_5 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_4 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_4 a_5 d_6 \cos a_1 \cos a_4 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_5 \cos a_1 \cos a_5 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_6 \cos a_1 \cos a_5 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_3 \sin a_4 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 + a_3 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_3 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_4 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_4 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_4 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_1 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 - a_5^2 d_2 \cos a_2 \cos a_4 \cos q_3 \\
& \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_3 \cos q_5^2 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 - a_1 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_3 \cos q_4 \\
& \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_4 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 +
\end{aligned}$$

$$\begin{aligned}
& a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^2 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^2 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a^2 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d^3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^3 a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^3 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^3 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a^3 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d^2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^4 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^3 \cos@a1D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a^4 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^4 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a^4 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& a^5 d^3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a^2 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a^2 a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a^2 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a^2 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a^5 d^1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a^2 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a^2 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a^5 d^1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a^5 d^3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a^3 a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a^3 a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a^3 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a^3 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a^3 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a^3 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a^5 d^1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a^5 d^2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a^4 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a^4 a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a^4 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a^4 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q6D + a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q6D - \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q6D + a3 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D
\end{aligned}$$

[illegible]

a3 a5 d6 Cos@a1D Cos@a5D Cos@q3D Cos@q4D Cos@q5D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q3D Sin@q6D + a2 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q3D Sin@q6D - a2 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q3D Sin@q6D - a3 a5 d1 Cos@a1D Cos@a4D Cos@q3D Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q3D Sin@q6D + a1 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D - a1 a5 d6 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D - a1 a5 d5 Cos@a3D Cos@a5D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D + a1 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D - a4 a5 d3 Cos@a3D Cos@a4D Cos@q2D Cos@q4D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D + a4 a5 d5 Cos@a3D Cos@a5D Cos@q2D Cos@q4D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D - a4 a5 d6 Cos@a3D Cos@a5D Cos@q2D Cos@q4D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D - a1 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D + a1 a5 d6 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D + a1 a5 d5 Cos@a2D Cos@a5D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D - a4 a5 d2 Cos@a2D Cos@a4D Cos@q3D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D - a4 a5 d5 Cos@a2D Cos@a5D Cos@q3D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D + a4 a5 d6 Cos@a2D Cos@a5D Cos@q3D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D + a1 a5 d2 Cos@a2D Cos@a3D Cos@q1D Cos@q5D<sup>2</sup> Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q4D Sin@q6D - a4 a5 d2 Cos@a2D Cos@a3D Cos@q4D Cos@q5D<sup>2</sup> Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q4D Sin@q6D - a2 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D + a2 a5 d6 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D - a2 a5 d5 Cos@a3D Cos@a5D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D - a2 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D + a4 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D - a4 a5 d6 Cos@a3D Cos@a4D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D

[illegible]



$$\begin{aligned}
& \cos^2 q_5 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 - \\
& a_3 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos^2 q_5 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_4 \sin q_6 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_4 \\
& \cos^2 q_5 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_4 \sin q_6 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_4 \cos^2 q_5 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_4 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos^2 q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_2 \cos^2 q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_1 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 - a_5^2 d_2 \cos a_2 \cos a_4 \cos q_3 \\
& \cos^2 q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_2 \cos a_4 \cos q_3 \cos^2 q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 - a_1 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 + \\
& a_1 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_3 \cos q_4 \\
& \cos^2 q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_1 \sin q_5 \sin q_6 - \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_4 \cos^2 q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_1 \sin q_5 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos^2 q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_4 \cos a_3 \cos a_4 \cos q_1 \cos^2 q_5 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_2 a_5 d_1 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_2 a_5 d_4 \cos a_1 \cos a_4 \cos q_2 \cos q_3 \cos q_5 \sin a_2 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 + a_5^2 d_1 \cos a_1 \cos a_4 \cos q_3 \\
& \cos^2 q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_5^2 d_4 \cos a_1 \cos a_4 \cos q_3 \cos^2 q_5 \sin a_2 \sin a_3 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 + a_2 a_5 d_1 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \\
& \cos q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 - \\
& a_2 a_5 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_2 \sin q_5 \sin q_6 - a_5^2 d_1 \cos a_1 \cos a_3 \cos q_4 \\
& \cos^2 q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_2 \sin q_5 \sin q_6 + \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_4 \cos^2 q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_2 \sin q_5 \sin q_6 - a_3 a_5 d_2 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 + \\
& a_3 a_5 d_4 \cos a_2 \cos a_4 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_3 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_2 \cos a_4 \cos q_1 \\
& \cos^2 q_5 \sin a_1 \sin a_3 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 -
\end{aligned}$$

$$\begin{aligned}
& a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^3 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^3 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a^3 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^3 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d^2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a^4 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a^4 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^4 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a^4 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5 d^2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6DL, \\
& Ha1 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^1 a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^2 a^5 d^3 \cos@a3D \cos@a4D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^2 a^5 d^4 \cos@a3D \cos@a4D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^1 a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a^1 a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a^3 a^5 d^2 \cos@a2D \cos@a4D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a^3 a^5 d^4 \cos@a2D \cos@a4D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a^2 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \cos@q6D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q5D - \\
& a^2 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q6D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q5D - \\
& a^3 a^5 d^1 \cos@a1D \cos@a4D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q5D + \\
& a^3 a^5 d^4 \cos@a1D \cos@a4D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q5D + \\
& a^1 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \cos@q6D \sin@a1D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D - \\
& a^1 a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q6D \sin@a1D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D - \\
& a^4 a^5 d^2 \cos@a2D \cos@a3D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D +
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned} & \cos^5 D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\ & a_4 a_5 d_3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\ & \sin@q2D \sin@q4D \sin@q6D + a_3 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\ & \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\ & a_3 a_5 d_6 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a_3 a_5 d_5 \cos@a2D \cos@a5D \cos@q1D \\ & \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\ & a_3 a_5 d_6 \cos@a2D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a_4 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \\ & \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\ & a_4 a_5 d_6 \cos@a2D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a_4 a_5 d_5 \cos@a2D \cos@a5D \cos@q1D \\ & \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\ & a_4 a_5 d_6 \cos@a2D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a_3 a_5 d_1 \cos@a1D \cos@a4D \cos@q2D \\ & \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\ & a_3 a_5 d_6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a_3 a_5 d_5 \cos@a1D \cos@a5D \cos@q2D \\ & \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\ & a_3 a_5 d_6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a_4 a_5 d_1 \cos@a1D \cos@a4D \cos@q2D \\ & \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\ & a_4 a_5 d_6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a_4 a_5 d_5 \cos@a1D \cos@a5D \cos@q2D \\ & \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\ & a_4 a_5 d_6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a_3 a_5 d_1 \cos@a1D \cos@a2D \cos@q3D \\ & \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\ & a_3 a_5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a_4 a_5 d_1 \cos@a1D \cos@a2D \cos@q4D \\ & \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\ & a_4 a_5 d_2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\ & \sin@q3D \sin@q4D \sin@q6D - a_1 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\ & \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\ & a_1 a_5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\ & \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a_5^2 d_3 \cos@a3D \cos@a4D \cos@q2D \\ & \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\ & a_5^2 d_4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\ & \sin@q1D \sin@q5D \sin@q6D + a_1 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\ & \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\ & a_1 a_5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\ & \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a_5^2 d_2 \cos@a2D \cos@a4D \cos@q3D \\ & \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\ & a_5^2 d_4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\ & \sin@q1D \sin@q5D \sin@q6D - a_1 a_5 d_2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\ & \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \end{aligned}$$

a1 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a4D Sin@a5D  
Sin@a6D Sin@q1D Sin@q5D Sin@q6D + a5<sup>2</sup> d2 Cos@a2D Cos@a3D Cos@q4D  
Cos@q5D<sup>2</sup> Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D -  
a5<sup>2</sup> d3 Cos@a2D Cos@a3D Cos@q4D Cos@q5D<sup>2</sup> Sin@a1D Sin@a4D Sin@a5D Sin@a6D  
Sin@q1D Sin@q5D Sin@q6D + a2 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q2D  
Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D -  
a2 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a5D  
Sin@a6D Sin@q2D Sin@q5D Sin@q6D - a5<sup>2</sup> d3 Cos@a3D Cos@a4D Cos@q1D  
Cos@q5D<sup>2</sup> Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D +  
a5<sup>2</sup> d4 Cos@a3D Cos@a4D Cos@q1D Cos@q5D<sup>2</sup> Sin@a1D Sin@a2D Sin@a5D Sin@a6D  
Sin@q2D Sin@q5D Sin@q6D - a2 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q3D  
Cos@q5D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D +  
a2 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a5D  
Sin@a6D Sin@q2D Sin@q5D Sin@q6D + a5<sup>2</sup> d1 Cos@a1D Cos@a4D Cos@q3D  
Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D -  
a5<sup>2</sup> d4 Cos@a1D Cos@a4D Cos@q3D Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D  
Sin@q2D Sin@q5D Sin@q6D + a2 a5 d1 Cos@a1D Cos@a3D Cos@q2D Cos@q4D  
Cos@q5D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D -  
a2 a5 d3 Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q5D Sin@a2D Sin@a4D Sin@a5D  
Sin@a6D Sin@q2D Sin@q5D Sin@q6D - a5<sup>2</sup> d1 Cos@a1D Cos@a3D Cos@q4D  
Cos@q5D<sup>2</sup> Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D +  
a5<sup>2</sup> d3 Cos@a1D Cos@a3D Cos@q4D Cos@q5D<sup>2</sup> Sin@a2D Sin@a4D Sin@a5D Sin@a6D  
Sin@q2D Sin@q5D Sin@q6D - a3 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q3D  
Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D +  
a3 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D  
Sin@a6D Sin@q3D Sin@q5D Sin@q6D + a5<sup>2</sup> d2 Cos@a2D Cos@a4D Cos@q1D  
Cos@q5D<sup>2</sup> Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -  
a5<sup>2</sup> d4 Cos@a2D Cos@a4D Cos@q1D Cos@q5D<sup>2</sup> Sin@a1D Sin@a3D Sin@a5D Sin@a6D  
Sin@q3D Sin@q5D Sin@q6D + a3 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q3D  
Cos@q5D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -  
a3 a5 d4 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a5D  
Sin@a6D Sin@q3D Sin@q5D Sin@q6D - a5<sup>2</sup> d1 Cos@a1D Cos@a4D Cos@q2D  
Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D +  
a5<sup>2</sup> d4 Cos@a1D Cos@a4D Cos@q2D Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D  
Sin@q3D Sin@q5D Sin@q6D - a3 a5 d1 Cos@a1D Cos@a2D Cos@q3D Cos@q4D  
Cos@q5D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D +  
a3 a5 d2 Cos@a1D Cos@a2D Cos@q3D Cos@q4D Cos@q5D Sin@a3D Sin@a4D Sin@a5D  
Sin@a6D Sin@q3D Sin@q5D Sin@q6D + a5<sup>2</sup> d1 Cos@a1D Cos@a2D Cos@q4D  
Cos@q5D<sup>2</sup> Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D -  
a5<sup>2</sup> d2 Cos@a1D Cos@a2D Cos@q4D Cos@q5D<sup>2</sup> Sin@a3D Sin@a4D Sin@a5D Sin@a6D  
Sin@q3D Sin@q5D Sin@q6D + a4 a5 d2 Cos@a2D Cos@a3D Cos@q1D Cos@q4D  
Cos@q5D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6D -  
a4 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a4D Sin@a5D  
Sin@a6D Sin@q4D Sin@q5D Sin@q6D - a5<sup>2</sup> d2 Cos@a2D Cos@a3D Cos@q1D  
Cos@q5D<sup>2</sup> Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q4D Sin@q5D Sin@q6D +  
a5<sup>2</sup> d3 Cos@a2D Cos@a3D Cos@q1D Cos@q5D<sup>2</sup> Sin@a1D Sin@a4D Sin@a5D Sin@a6D



$$\begin{aligned}
& \sin@q4D \sin@q5D \sin@q6D - a^4 a^5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^4 a^5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a^4 a^5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^4 a^5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6DL, \\
H- & a^1 a^5 d4 \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a^1 a^5 d6 \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^2 a^5 d4 \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a^2 a^5 d6 \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^1 a^5 d3 \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D - a^1 a^5 d6 \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D - \\
& a^2 a^5 d3 \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q5D + a^2 a^5 d6 \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q5D + \\
& a^1 a^5 d4 \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D - a^1 a^5 d6 \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a^3 a^5 d4 \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D + a^3 a^5 d6 \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a^1 a^5 d2 \cos@a2D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D + a^1 a^5 d6 \cos@a2D \cos@q1D \cos@q4D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q3D \sin@q5D + \\
& a^3 a^5 d2 \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q3D \sin@q5D - a^3 a^5 d6 \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q3D \sin@q5D - \\
& a^2 a^5 d4 \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q2D \sin@q3D \sin@q5D + a^2 a^5 d6 \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q5D + \\
& a^3 a^5 d4 \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q2D \sin@q3D \sin@q5D - a^3 a^5 d6 \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q5D + \\
& a^2 a^5 d1 \cos@a1D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q2D \sin@q3D \sin@q5D - a^2 a^5 d6 \cos@a1D \cos@q2D \cos@q4D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q5D - \\
& a^3 a^5 d1 \cos@a1D \cos@q3D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D
\end{aligned}$$

$$\begin{aligned}
& \sin@q2D \sin@q3D \sin@q5D + a3 a5 d6 \cos@a1D \cos@q3D \cos@q4D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q5D - \\
& a1 a5 d3 \cos@a3D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q5D + a1 a5 d6 \cos@a3D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D + \\
& a4 a5 d3 \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q5D - a4 a5 d6 \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D + \\
& a1 a5 d2 \cos@a2D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q5D - a1 a5 d6 \cos@a2D \cos@q1D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D - \\
& a4 a5 d2 \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q5D + a4 a5 d6 \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q5D + \\
& a2 a5 d3 \cos@a3D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q5D - a2 a5 d6 \cos@a3D \cos@q1D \cos@q2D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q5D - \\
& a4 a5 d3 \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q5D + a4 a5 d6 \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q5D - \\
& a2 a5 d1 \cos@a1D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q5D + a2 a5 d6 \cos@a1D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q5D + \\
& a4 a5 d1 \cos@a1D \cos@q3D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q2D \sin@q4D \sin@q5D - a4 a5 d6 \cos@a1D \cos@q3D \cos@q4D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q5D - \\
& a3 a5 d2 \cos@a2D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q5D + a3 a5 d6 \cos@a2D \cos@q1D \cos@q3D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a4 a5 d2 \cos@a2D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q5D - a4 a5 d6 \cos@a2D \cos@q1D \cos@q4D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a3 a5 d1 \cos@a1D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q5D - a3 a5 d6 \cos@a1D \cos@q2D \cos@q3D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a4 a5 d1 \cos@a1D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q5D + a4 a5 d6 \cos@a1D \cos@q2D \cos@q4D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a1 a5 d4 \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d6 \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d4 \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d6 \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d3 \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a1 a5 d6 \cos@a3D \cos@q1D \cos@q4D
\end{aligned}$$

[illegible]

$$\begin{aligned}
& \text{a2 a5 d1 Cos@a1D Cos@q2D Cos@q3D Cos@q5D Sin@a4D Sin@a6D} \\
& \quad \text{Sin@q2D Sin@q4D Sin@q6D - a2 a5 d6 Cos@a1D Cos@q2D Cos@q3D} \\
& \quad \text{Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D -} \\
& \text{a4 a5 d1 Cos@a1D Cos@q3D Cos@q4D Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D} \\
& \quad \text{Sin@q2D Sin@q4D Sin@q6D + a4 a5 d6 Cos@a1D Cos@q3D Cos@q4D} \\
& \quad \text{Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D +} \\
& \text{a3 a5 d2 Cos@a2D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D} \\
& \quad \text{Sin@q3D Sin@q4D Sin@q6D - a3 a5 d6 Cos@a2D Cos@q1D Cos@q3D} \\
& \quad \text{Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q6D -} \\
& \text{a4 a5 d2 Cos@a2D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D} \\
& \quad \text{Sin@q3D Sin@q4D Sin@q6D + a4 a5 d6 Cos@a2D Cos@q1D Cos@q4D} \\
& \quad \text{Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q6D -} \\
& \text{a3 a5 d1 Cos@a1D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D} \\
& \quad \text{Sin@q3D Sin@q4D Sin@q6D + a3 a5 d6 Cos@a1D Cos@q2D Cos@q3D} \\
& \quad \text{Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q6D +} \\
& \text{a4 a5 d1 Cos@a1D Cos@q2D Cos@q4D Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D} \\
& \quad \text{Sin@q3D Sin@q4D Sin@q6D - a4 a5 d6 Cos@a1D Cos@q2D Cos@q4D Cos@q5D} \\
& \quad \text{Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q6DL ' } \\
\text{H- a1 a5 d4 Cos@a4D}^2 & \text{Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D} \\
& \quad \text{Sin@q1D Sin@q2D Sin@q5D + a1 a5 d6 Cos@a4D}^2 \text{Cos@q1D Cos@q3D Cos@q6D Sin@a1D} \\
& \quad \text{Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a1 a5 d5 Cos@a4D Cos@a5D} \\
& \quad \text{Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a1 a5 d6 Cos@a4D Cos@a5D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a2 a5 d4 Cos@a4D}^2 \text{Cos@q2D Cos@q3D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a2 a5 d6 Cos@a4D}^2 & \text{Cos@q2D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D} \\
& \quad \text{Sin@q1D Sin@q2D Sin@q5D - a2 a5 d5 Cos@a4D Cos@a5D Cos@q2D Cos@q3D} \\
& \quad \text{Cos@q6D Sin@a1D Sin@a2D Sin@a3D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a2 a5 d6 Cos@a4D Cos@a5D Cos@q2D Cos@q3D Cos@q6D Sin@a1D Sin@a2D Sin@a3D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a1 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a1 a5 d6 Cos@a3D Cos@a4D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D - a1 a5 d5 Cos@a3D Cos@a5D Cos@q1D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a1 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D - a2 a5 d3 Cos@a3D Cos@a4D Cos@q2D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a2 a5 d6 Cos@a3D Cos@a4D Cos@q2D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a2 a5 d5 Cos@a3D Cos@a5D Cos@q2D} \\
& \quad \text{Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -} \\
& \text{a2 a5 d6 Cos@a3D Cos@a5D Cos@q2D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D - a1 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\
& \quad \text{Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q2D Sin@q5D +} \\
& \text{a1 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D} \\
& \quad \text{Sin@a6D Sin@q1D Sin@q2D Sin@q5D + a2 a5 d3 Cos@a3D Cos@a4D Cos@q2D} \\
& \quad \text{Cos@q5D Cos@q6D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q2D Sin@q5D -}
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& a^3 a^5 d^6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - a^4 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a^4 a^5 d^6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a^4 a^5 d^5 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a^4 a^5 d^6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - a^3 a^5 d^1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a^3 a^5 d^2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a^4 a^5 d^1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a^4 a^5 d^2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a^1 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - a^1 a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a^5 d^3 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a^5 d^4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - a^1 a^5 d^2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + a^1 a^5 d^4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a^5 d^2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a^5 d^4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + a^1 a^5 d^2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - a^1 a^5 d^3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a^5 d^2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a^5 d^3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - a^2 a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + a^2 a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a^5 d^3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a^5 d^4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + a^2 a^5 d^1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - a^2 a^5 d^4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a^5 d^1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a^5 d^4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - a^2 a^5 d^1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + a^2 a^5 d^3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D
\end{aligned}$$



$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

$$\begin{aligned} & \cos^5 D^2 \sin @a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\ & a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \\ & \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a3D \cos@q4D \\ & \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\ & a4 a5 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\ & \sin@q2D \sin@q4D \sin@q6D + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\ & \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\ & a3 a5 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a3 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\ & \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\ & a3 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\ & \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\ & a4 a5 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\ & \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\ & a4 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\ & \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\ & a3 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a3 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\ & \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\ & a3 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\ & \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\ & a4 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\ & \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\ & a4 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\ & \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\ & a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \\ & \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a2D \cos@q4D \\ & \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\ & a4 a5 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\ & \sin@q3D \sin@q4D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\ & \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\ & a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\ & \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a5^2 d3 \cos@a3D \cos@a4D \cos@q2D \\ & \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\ & a5^2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\ & \sin@q1D \sin@q5D \sin@q6D + a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\ & \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\ & a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\ & \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \\ & \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \end{aligned}$$

$$\begin{aligned}
& a^5 d_4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D - a_1 a_5 d_2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a_1 a_5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a^5 d_2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^5 d_3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a_2 a_5 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a_2 a_5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a_2 a_5 d_1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a_2 a_5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a^5 d_1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^5 d_4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a_2 a_5 d_1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a_2 a_5 d_3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 d_1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 d_3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a_3 a_5 d_2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a_3 a_5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d_2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a_3 a_5 d_1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a_3 a_5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a^5 d_1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a^5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a_3 a_5 d_1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a_3 a_5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a^5 d_1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a^5 d_2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a_4 a_5 d_2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a_4 a_5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D
\end{aligned}$$

$$\begin{aligned}
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a^5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a^5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a^5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a^5 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D <, \\
8H- & a1 d4 \cos@a4D^2 \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a1 d6 \cos@a4D^2 \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a1 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D - \\
& a1 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a2 d4 \cos@a4D^2 \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D - \\
& a2 d6 \cos@a4D^2 \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D - \\
& a2 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a2 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a1 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a1 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a1 d5 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a1 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a2 d3 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a2 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D + \\
& a2 d5 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a2 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \sin@a1D \sin@a2D \sin@a4D \sin@q1D \sin@q2D - \\
& a1 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D + \\
& a1 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D + \\
& a2 d3 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D - \\
& a2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@q1D \sin@q2D + \\
& a1 d4 \cos@a4D^2 \cos@q1D \cos@q2D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D - \\
& a1 d6 \cos@a4D^2 \cos@q1D \cos@q2D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D - \\
& a1 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D + \\
& a1 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D - \\
& a3 d4 \cos@a4D^2 \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D + \\
& a3 d6 \cos@a4D^2 \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D + \\
& a3 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D - \\
& a3 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q3D - \\
& a1 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D + \\
& a1 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D + \\
& a1 d5 \cos@a2D \cos@a5D \cos@q1D \cos@q4D \sin@a1D \sin@a3D \sin@a4D \sin@q1D \sin@q3D -
\end{aligned}$$

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q5D^2 - a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D
\end{aligned}$$

$$\begin{aligned}
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q2D \sin@q6D -
\end{aligned}$$



[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& a^5 a^6 d_6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a^3 a^5 d_5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a^3 a^5 d_6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a^4 a^5 d_1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a^4 a^5 d_6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a^4 a^5 d_5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a^4 a^5 d_6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D + a^3 a^5 d_1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D - \\
& a^3 a^5 d_2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q6D - a^4 a^5 d_1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q6D + \\
& a^4 a^5 d_2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q4D \sin@q6D - a^1 a^5 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^1 a^5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a^5 a^2 d_3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^5 a^2 d_4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a^1 a^5 d_2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^1 a^5 d_4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a^5 a^2 d_2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^5 a^2 d_4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D - a^1 a^5 d_2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a^1 a^5 d_3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a^5 a^2 d_2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a^5 a^2 d_3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a^2 a^5 d_3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^2 a^5 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a^5 a^2 d_3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^5 a^2 d_4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a^2 a^5 d_1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a^2 a^5 d_4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a^5 a^2 d_1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a^5 a^2 d_4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D
\end{aligned}$$

$$\begin{aligned}
& \sin@q2D \sin@q5D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d2 \cos@a1D \cos@a2D \\
& \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6DL, \\
& H- a1 d4 \cos@a4D^2 \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a1 d6 \cos@a4D^2 \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D + \\
& a1 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D - \\
& a1 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \sin@a1D \sin@a2D \sin@a3D \sin@q1D \sin@q2D +
\end{aligned}$$

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

a4 a5 d6 Cos@a2D Cos@a5D Cos@q3D Cos@q4D Cos@q6D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q5D - a1 a5 d2 Cos@a2D Cos@a3D Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q4D Sin@q5D + a1 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q4D Sin@q5D + a4 a5 d2 Cos@a2D Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q4D Sin@q5D + a2 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D a2 a5 d6 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D - a2 a5 d5 Cos@a3D Cos@a5D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D + a2 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q2D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D - a4 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D + a4 a5 d5 Cos@a3D Cos@a5D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D - a4 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D - a2 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D + a2 a5 d6 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D + a2 a5 d5 Cos@a1D Cos@a5D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D - a2 a5 d6 Cos@a1D Cos@a5D Cos@q2D Cos@q3D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D + a4 a5 d1 Cos@a1D Cos@a4D Cos@q3D Cos@q4D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D - a4 a5 d5 Cos@a1D Cos@a5D Cos@q3D Cos@q4D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D + a4 a5 d6 Cos@a1D Cos@a5D Cos@q3D Cos@q4D Cos@q6D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q5D + a2 a5 d1 Cos@a1D Cos@a3D Cos@q2D Cos@q5D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q4D Sin@q5D - a4 a5 d1 Cos@a1D Cos@a3D Cos@q4D Cos@q5D Cos@q6D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q4D Sin@q5D - a3 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D + a3 a5 d5 Cos@a2D Cos@a5D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D - a3 a5 d6 Cos@a2D Cos@a5D Cos@q1D Cos@q3D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D + a4 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D - a4 a5 d6 Cos@a2D Cos@a4D Cos@q1D Cos@q4D Cos@q6D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q5D -

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D - a4 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a4 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a3 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D - a3 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a3 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D - a4 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a4 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a4 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a4 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d3 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D
\end{aligned}$$

$$\begin{aligned}
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 -
\end{aligned}$$

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q3D \sin@q6D - a1 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + \\
& a1 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q6D - a3 a5 d2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + \\
& a3 a5 d6 \cos@a2D \cos@a4D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q6D + a3 a5 d5 \cos@a2D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q3D \sin@q6D - \\
& a3 a5 d6 \cos@a2D \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q6D - a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q3D \sin@q6D + \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q6D + a3 a5 d2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q3D \sin@q6D - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q3D \sin@q6D + a2 a5 d4 \cos@a4D^2 \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a2 a5 d6 \cos@a4D^2 \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q2D \sin@q3D \sin@q6D - a2 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q6D + \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D - a3 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q6D + \\
& a3 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q2D \sin@q3D \sin@q6D + a3 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a3 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D - a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q6D + \\
& a2 a5 d6 \cos@a1D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D + a2 a5 d5 \cos@a1D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a2 a5 d6 \cos@a1D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a3 a5 d6 \cos@a1D \cos@a4D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D - a3 a5 d5 \cos@a1D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q6D + \\
& a3 a5 d6 \cos@a1D \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q6D + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q3D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D
\end{aligned}$$



[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a5^2 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D - a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D + \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q5D \sin@q6D + a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D
\end{aligned}$$

$$\begin{aligned}
& \cos q_5 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 + \\
& a_3 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \cos q_5 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_3 \sin q_5 \sin q_6 + a_5^2 d_1 \cos a_1 \cos a_2 \cos q_4 \\
& \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_3 \sin q_5 \sin q_6 - \\
& a_5^2 d_2 \cos a_1 \cos a_2 \cos q_4 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_3 \sin q_5 \sin q_6 + a_4 a_5 d_2 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \\
& \cos q_5 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 - \\
& a_4 a_5 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5 \sin q_6 - a_5^2 d_2 \cos a_2 \cos a_3 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 + \\
& a_5^2 d_3 \cos a_2 \cos a_3 \cos q_1 \cos q_5^2 \sin a_1 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_4 \sin q_5 \sin q_6 - a_4 a_5 d_1 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \\
& \cos q_5 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 + \\
& a_4 a_5 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \cos q_5 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5 \sin q_6 + a_5^2 d_1 \cos a_1 \cos a_3 \cos q_2 \\
& \cos q_5^2 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 - \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_5^2 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \\
& \sin q_4 \sin q_5 \sin q_6 + a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \\
& \cos q_5 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 - \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \cos q_5 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5 \sin q_6 - a_5^2 d_1 \cos a_1 \cos a_2 \cos q_3 \cos q_5^2 \\
& \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6 + a_5^2 d_2 \cos a_1 \cos a_2 \\
& \cos q_3 \cos q_5^2 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5 \sin q_6, 0, \\
& \text{Ha1 } a_6 d_4 \cos a_4^2 \cos q_1 \cos q_3 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin q_1 \sin q_2 - \\
& a_1 a_6 d_6 \cos a_4^2 \cos q_1 \cos q_3 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin q_1 \sin q_2 - \\
& a_1 a_6 d_5 \cos a_4 \cos a_5 \cos q_1 \cos q_3 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin q_1 \sin q_2 + \\
& a_1 a_6 d_6 \cos a_4 \cos a_5 \cos q_1 \cos q_3 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin q_1 \sin q_2 - \\
& a_2 a_6 d_4 \cos a_4^2 \cos q_2 \cos q_3 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin q_1 \sin q_2 + \\
& a_2 a_6 d_6 \cos a_4^2 \cos q_2 \cos q_3 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin q_1 \sin q_2 + \\
& a_2 a_6 d_5 \cos a_4 \cos a_5 \cos q_2 \cos q_3 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin q_1 \sin q_2 - \\
& a_2 a_6 d_6 \cos a_4 \cos a_5 \cos q_2 \cos q_3 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin q_1 \sin q_2 - \\
& a_1 a_6 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_4 \cos q_6 \sin a_1 \sin a_2 \sin a_4 \sin q_1 \sin q_2 + \\
& a_1 a_6 d_6 \cos a_3 \cos a_4 \cos q_1 \cos q_4 \cos q_6 \sin a_1 \sin a_2 \sin a_4 \sin q_1 \sin q_2 + \\
& a_1 a_6 d_5 \cos a_3 \cos a_5 \cos q_1 \cos q_4 \cos q_6 \sin a_1 \sin a_2 \sin a_4 \sin q_1 \sin q_2 - \\
& a_1 a_6 d_6 \cos a_3 \cos a_5 \cos q_1 \cos q_4 \cos q_6 \sin a_1 \sin a_2 \sin a_4 \sin q_1 \sin q_2 + \\
& a_2 a_6 d_3 \cos a_3 \cos a_4 \cos q_2 \cos q_4 \cos q_6 \sin a_1 \sin a_2 \sin a_4 \sin q_1 \sin q_2 - \\
& a_2 a_6 d_6 \cos a_3 \cos a_4 \cos q_2 \cos q_4 \cos q_6 \sin a_1 \sin a_2 \sin a_4 \sin q_1 \sin q_2 - \\
& a_2 a_6 d_5 \cos a_3 \cos a_5 \cos q_2 \cos q_4 \cos q_6 \sin a_1 \sin a_2 \sin a_4 \sin q_1 \sin q_2 + \\
& a_2 a_6 d_6 \cos a_3 \cos a_5 \cos q_2 \cos q_4 \cos q_6 \sin a_1 \sin a_2 \sin a_4 \sin q_1 \sin q_2 + \\
& a_1 a_6 d_3 \cos a_3 \cos a_4 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_2 \sin a_5 \sin q_1 \sin q_2 - \\
& a_1 a_6 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5 \cos q_6 \sin a_1 \sin a_2 \sin a_5 \sin q_1 \sin q_2 - \\
& a_2 a_6 d_3 \cos a_3 \cos a_4 \cos q_2 \cos q_5 \cos q_6 \sin a_1 \sin a_2 \sin a_5 \sin q_1 \sin q_2 + \\
& a_2 a_6 d_4 \cos a_3 \cos a_4 \cos q_2 \cos q_5 \cos q_6 \sin a_1 \sin a_2 \sin a_5 \sin q_1 \sin q_2 - \\
& a_1 a_6 d_4 \cos a_4^2 \cos q_1 \cos q_2 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin q_1 \sin q_3 + \\
& a_1 a_6 d_6 \cos a_4^2 \cos q_1 \cos q_2 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin q_1 \sin q_3 + \\
& a_1 a_6 d_5 \cos a_4 \cos a_5 \cos q_1 \cos q_2 \cos q_6 \sin a_1 \sin a_2 \sin a_3 \sin q_1 \sin q_3 -
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q4D \sin@q5D - \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q4D \sin@q5D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d3 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a1 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D
\end{aligned}$$

$$\begin{aligned}
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 - a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a1 a5 d4 \cos@a4D^2 \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a1 a5 d6 \cos@a4D^2 \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D - a1 a5 d5 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a4D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a2 a5 d4 \cos@a4D^2 \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a2 a5 d6 \cos@a4D^2 \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \\
& \sin@q1D \sin@q2D \sin@q6D + a2 a5 d5 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a3D \sin@a6D \sin@q1D \sin@q2D \sin@q6D - \\
& a2 a5 d6 \cos@a4D \cos@a5D \cos@q2D \cos@q3D \cos@q5D \sin@a1D \sin@a2D \sin@a3D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D - a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q2D \sin@q6D + a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q2D \sin@q6D -
\end{aligned}$$

[illegible]

[illegible]

$$\begin{aligned}
& \text{Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q4D Sin@q6D} - \\
& \text{a4 a5 d6 Cos@a2D Cos@a4D Cos@q3D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q1D Sin@q4D Sin@q6D} - \text{a4 a5 d5 Cos@a2D Cos@a5D Cos@q3D} \\
& \text{Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q1D Sin@q4D Sin@q6D} + \\
& \text{a4 a5 d6 Cos@a2D Cos@a5D Cos@q3D Cos@q4D Cos@q5D Sin@a1D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q1D Sin@q4D Sin@q6D} + \text{a1 a5 d2 Cos@a2D Cos@a3D Cos@q1D} \\
& \text{Cos@q5D}^2 \text{ Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q4D Sin@q6D} - \\
& \text{a1 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q5D}^2 \text{ Sin@a1D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q1D Sin@q4D Sin@q6D} - \text{a4 a5 d2 Cos@a2D Cos@a3D Cos@q4D} \\
& \text{Cos@q5D}^2 \text{ Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q4D Sin@q6D} + \\
& \text{a4 a5 d3 Cos@a2D Cos@a3D Cos@q4D Cos@q5D}^2 \text{ Sin@a1D Sin@a4D Sin@a5D Sin@a6D} \\
& \text{Sin@q1D Sin@q4D Sin@q6D} - \text{a2 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q2D} \\
& \text{Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \\
& \text{a2 a5 d5 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a4D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \text{a2 a5 d5 Cos@a3D Cos@a5D Cos@q1D} \\
& \text{Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} - \\
& \text{a2 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a4D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \text{a4 a5 d3 Cos@a3D Cos@a4D Cos@q1D} \\
& \text{Cos@q4D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} - \\
& \text{a4 a5 d6 Cos@a3D Cos@a4D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a2D Sin@a4D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q6D} - \text{a4 a5 d5 Cos@a3D Cos@a5D Cos@q1D} \\
& \text{Cos@q4D Cos@q5D Sin@a1D Sin@a2D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \\
& \text{a4 a5 d6 Cos@a3D Cos@a5D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a2D Sin@a4D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \text{a2 a5 d1 Cos@a1D Cos@a4D Cos@q2D} \\
& \text{Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} - \\
& \text{a2 a5 d6 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q6D} - \text{a2 a5 d5 Cos@a1D Cos@a5D Cos@q2D} \\
& \text{Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \\
& \text{a2 a5 d6 Cos@a1D Cos@a5D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q6D} - \text{a4 a5 d1 Cos@a1D Cos@a4D Cos@q3D} \\
& \text{Cos@q4D Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \\
& \text{a4 a5 d6 Cos@a1D Cos@a4D Cos@q3D Cos@q4D Cos@q5D Sin@a2D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \text{a4 a5 d5 Cos@a1D Cos@a5D Cos@q3D} \\
& \text{Cos@q4D Cos@q5D Sin@a2D Sin@a3D Sin@a4D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} - \\
& \text{a4 a5 d6 Cos@a1D Cos@a5D Cos@q3D Cos@q4D Cos@q5D Sin@a2D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q6D} - \text{a2 a5 d1 Cos@a1D Cos@a3D Cos@q2D} \\
& \text{Cos@q5D}^2 \text{ Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \\
& \text{a2 a5 d3 Cos@a1D Cos@a3D Cos@q2D Cos@q5D}^2 \text{ Sin@a2D Sin@a4D Sin@a5D} \\
& \text{Sin@a6D Sin@q2D Sin@q4D Sin@q6D} + \text{a4 a5 d1 Cos@a1D Cos@a3D Cos@q4D} \\
& \text{Cos@q5D}^2 \text{ Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q4D Sin@q6D} - \\
& \text{a4 a5 d3 Cos@a1D Cos@a3D Cos@q4D Cos@q5D}^2 \text{ Sin@a2D Sin@a4D Sin@a5D Sin@a6D} \\
& \text{Sin@q2D Sin@q4D Sin@q6D} + \text{a3 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q3D} \\
& \text{Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q6D} - \\
& \text{a3 a5 d6 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a4D} \\
& \text{Sin@a6D Sin@q3D Sin@q4D Sin@q6D} - \text{a3 a5 d5 Cos@a2D Cos@a5D Cos@q1D} \\
& \text{Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a4D Sin@a6D Sin@q3D Sin@q4D Sin@q6D}
\end{aligned}$$



[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a2D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D - \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q5D \sin@q6D - a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \\
& \cos@q5D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D
\end{aligned}$$

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q1D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q5D^2 + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q5D^2 - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \\
& \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a2D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d4 \cos@a3D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a2D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 - a2 a5 d1 \cos@a1D \cos@a3D \cos@q2D \\
& \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 + \\
& a2 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q2D \sin@q5D^2 - \\
& a5^2 d3 \cos@a1D \cos@a3D \cos@q4D \cos@q5D \cos@q6D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q5D^2 + a3 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \\
& \cos@q6D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D \cos@q6D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 + a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 - \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \\
& \cos@q6D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D^2 + \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D \cos@q6D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D^2 - a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \\
& \cos@q6D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D^2 - \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D \cos@q6D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D^2 + a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D
\end{aligned}$$

$$\begin{aligned}
& \cos q_4 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_4 a_5 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_4 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 - a_5^2 d_1 \cos a_1 \cos a_3 \cos q_2 \cos q_5 \\
& \cos q_6 \sin a_2 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_5^2 d_3 \cos a_1 \cos a_3 \cos q_2 \cos q_5 \cos q_6 \sin a_2 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 - a_4 a_5 d_1 \cos a_1 \cos a_2 \cos q_3 \\
& \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 + \\
& a_4 a_5 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_4 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_5^2 d_1 \cos a_1 \cos a_2 \cos q_3 \cos q_5 \\
& \cos q_6 \sin a_3 \sin a_4 \sin a_5 \sin a_6 \sin q_4 \sin q_5^2 - \\
& a_5^2 d_2 \cos a_1 \cos a_2 \cos q_3 \cos q_5 \cos q_6 \sin a_3 \sin a_4 \sin a_5 \\
& \sin a_6 \sin q_4 \sin q_5^2 + a_1 a_5 d_4 \cos a_4^2 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_6 \cos a_4^2 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_1 \sin q_2 \sin q_6 - a_1 a_5 d_5 \cos a_4 \cos a_5 \cos q_1 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_1 a_5 d_6 \cos a_4 \cos a_5 \cos q_1 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_4 \cos a_4^2 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_2 a_5 d_6 \cos a_4^2 \cos q_2 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_1 \sin q_2 \sin q_6 + a_2 a_5 d_5 \cos a_4 \cos a_5 \cos q_2 \cos q_3 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_2 a_5 d_6 \cos a_4 \cos a_5 \cos q_2 \cos q_3 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_1 a_5 d_6 \cos a_3 \cos a_4 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_1 a_5 d_5 \cos a_3 \cos a_5 \cos q_1 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_6 \cos a_3 \cos a_5 \cos q_1 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_2 a_5 d_6 \cos a_3 \cos a_4 \cos q_2 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_5 \cos a_3 \cos a_5 \cos q_2 \\
& \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_2 a_5 d_6 \cos a_3 \cos a_5 \cos q_2 \cos q_4 \cos q_5 \sin a_1 \sin a_2 \sin a_4 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 + a_1 a_5 d_3 \cos a_3 \cos a_4 \cos q_1 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_2 \sin q_6 - \\
& a_1 a_5 d_4 \cos a_3 \cos a_4 \cos q_1 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_2 a_5 d_3 \cos a_3 \cos a_4 \cos q_2 \\
& \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \sin a_6 \sin q_1 \sin q_2 \sin q_6 + \\
& a_2 a_5 d_4 \cos a_3 \cos a_4 \cos q_2 \cos q_5^2 \sin a_1 \sin a_2 \sin a_5 \\
& \sin a_6 \sin q_1 \sin q_2 \sin q_6 - a_1 a_5 d_4 \cos a_4^2 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_3 \sin q_6 + \\
& a_1 a_5 d_6 \cos a_4^2 \cos q_1 \cos q_2 \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \\
& \sin q_1 \sin q_3 \sin q_6 + a_1 a_5 d_5 \cos a_4 \cos a_5 \cos q_1 \cos q_2 \\
& \cos q_5 \sin a_1 \sin a_2 \sin a_3 \sin a_6 \sin q_1 \sin q_3 \sin q_6 -
\end{aligned}$$

[illegible]

$$\begin{aligned}
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D - a3 a5 d5 \cos@a1D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \sin@a6D \sin@q2D \sin@q3D \sin@q6D + \\
& a3 a5 d6 \cos@a1D \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a2D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D + a2 a5 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q6D - \\
& a2 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q2D \sin@q3D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a4D \cos@q3D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q2D \sin@q3D \sin@q6D + \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q3D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q2D \sin@q3D \sin@q6D + a1 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a1 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a1 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a1 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d3 \cos@a3D \cos@a4D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a3D \cos@a4D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D + a4 a5 d5 \cos@a3D \cos@a5D \cos@q2D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a3D \cos@a5D \cos@q2D \cos@q4D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a1 a5 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a1 a5 d6 \cos@a2D \cos@a4D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D + a1 a5 d5 \cos@a2D \cos@a5D \cos@q1D \\
& \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a1 a5 d6 \cos@a2D \cos@a5D \cos@q1D \cos@q3D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a4D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a4 a5 d6 \cos@a2D \cos@a4D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d5 \cos@a2D \cos@a5D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a4 a5 d6 \cos@a2D \cos@a5D \cos@q3D \cos@q4D \cos@q5D \sin@a1D \sin@a3D \sin@a4D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D + a1 a5 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D - \\
& a1 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q1D \sin@q4D \sin@q6D - a4 a5 d2 \cos@a2D \cos@a3D \cos@q4D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q1D \sin@q4D \sin@q6D + \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q4D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q1D \sin@q4D \sin@q6D - a2 a5 d3 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \\
& \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D + \\
& a2 a5 d6 \cos@a3D \cos@a4D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a2 a5 d5 \cos@a3D \cos@a5D \cos@q1D \\
& \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \sin@a6D \sin@q2D \sin@q4D \sin@q6D - \\
& a2 a5 d6 \cos@a3D \cos@a5D \cos@q1D \cos@q2D \cos@q5D \sin@a1D \sin@a2D \sin@a4D \\
& \sin@a6D \sin@q2D \sin@q4D \sin@q6D + a4 a5 d3 \cos@a3D \cos@a4D \cos@q1D
\end{aligned}$$

[illegible]

a4 a5 d6 Cos@a1D Cos@a5D Cos@q4D Cos@q5D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q6D + a3 a5 d1 Cos@a1D Cos@a2D Cos@q3D Cos@q5D<sup>2</sup> Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q6D - a3 a5 d2 Cos@a1D Cos@a2D Cos@q3D Cos@q5D<sup>2</sup> Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q6D - a4 a5 d1 Cos@a1D Cos@a2D Cos@q4D Cos@q5D<sup>2</sup> Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q6D + a4 a5 d2 Cos@a1D Cos@a2D Cos@q4D Cos@q5D<sup>2</sup> Sin@a3D Sin@a4D Sin@a5D Sin@a6D Sin@q3D Sin@q4D Sin@q6D - a1 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D + a1 a5 d4 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D + a5<sup>2</sup> d3 Cos@a3D Cos@a4D Cos@q2D Cos@q5D<sup>2</sup> Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D - a5<sup>2</sup> d4 Cos@a3D Cos@a4D Cos@q2D Cos@q5D<sup>2</sup> Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D + a1 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D - a1 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D - a5<sup>2</sup> d2 Cos@a2D Cos@a4D Cos@q3D Cos@q5D<sup>2</sup> Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D + a5<sup>2</sup> d4 Cos@a2D Cos@a4D Cos@q3D Cos@q5D<sup>2</sup> Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D - a1 a5 d2 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D + a1 a5 d3 Cos@a2D Cos@a3D Cos@q1D Cos@q4D Cos@q5D Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D + a5<sup>2</sup> d2 Cos@a2D Cos@a3D Cos@q4D Cos@q5D<sup>2</sup> Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D - a5<sup>2</sup> d3 Cos@a2D Cos@a3D Cos@q4D Cos@q5D<sup>2</sup> Sin@a1D Sin@a4D Sin@a5D Sin@a6D Sin@q1D Sin@q5D Sin@q6D + a2 a5 d3 Cos@a3D Cos@a4D Cos@q1D Cos@q2D Cos@q5D Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D - a5<sup>2</sup> d3 Cos@a3D Cos@a4D Cos@q1D Cos@q5D<sup>2</sup> Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D + a5<sup>2</sup> d4 Cos@a3D Cos@a4D Cos@q1D Cos@q5D<sup>2</sup> Sin@a1D Sin@a2D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D - a2 a5 d1 Cos@a1D Cos@a4D Cos@q2D Cos@q3D Cos@q5D Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D + a5<sup>2</sup> d1 Cos@a1D Cos@a4D Cos@q3D Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D - a5<sup>2</sup> d4 Cos@a1D Cos@a4D Cos@q3D Cos@q5D<sup>2</sup> Sin@a2D Sin@a3D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D + a2 a5 d1 Cos@a1D Cos@a3D Cos@q2D Cos@q4D Cos@q5D Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D - a5<sup>2</sup> d1 Cos@a1D Cos@a3D Cos@q4D Cos@q5D<sup>2</sup> Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D + a5<sup>2</sup> d3 Cos@a1D Cos@a3D Cos@q4D Cos@q5D<sup>2</sup> Sin@a2D Sin@a4D Sin@a5D Sin@a6D Sin@q2D Sin@q5D Sin@q6D - a3 a5 d2 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D Sin@a6D Sin@q3D Sin@q5D Sin@q6D + a3 a5 d4 Cos@a2D Cos@a4D Cos@q1D Cos@q3D Cos@q5D Sin@a1D Sin@a3D Sin@a5D



$$\begin{aligned}
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d2 \cos@a2D \cos@a4D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d4 \cos@a2D \cos@a4D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a3 a5 d1 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \\
& \cos@q5D \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a3 a5 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q3D \cos@q5D \sin@a2D \sin@a3D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D - a5^2 d1 \cos@a1D \cos@a4D \cos@q2D \\
& \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a5^2 d4 \cos@a1D \cos@a4D \cos@q2D \cos@q5D^2 \sin@a2D \sin@a3D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D - a3 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \\
& \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D + \\
& a3 a5 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q3D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a2D \cos@q4D \\
& \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q3D \sin@q5D \sin@q6D - \\
& a5^2 d2 \cos@a1D \cos@a2D \cos@q4D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q3D \sin@q5D \sin@q6D + a4 a5 d2 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \\
& \cos@q5D \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a4 a5 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q4D \cos@q5D \sin@a1D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d2 \cos@a2D \cos@a3D \cos@q1D \\
& \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a5^2 d3 \cos@a2D \cos@a3D \cos@q1D \cos@q5D^2 \sin@a1D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D - a4 a5 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \\
& \cos@q5D \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d3 \cos@a1D \cos@a3D \cos@q2D \cos@q4D \cos@q5D \sin@a2D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D + a5^2 d1 \cos@a1D \cos@a3D \cos@q2D \cos@q5D^2 \\
& \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a5^2 d3 \cos@a1D \cos@a3D \\
& \cos@q2D \cos@q5D^2 \sin@a2D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D + \\
& a4 a5 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \\
& \sin@a6D \sin@q4D \sin@q5D \sin@q6D - a4 a5 d2 \cos@a1D \cos@a2D \cos@q3D \\
& \cos@q4D \cos@q5D \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D - \\
& a5^2 d1 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \sin@a3D \sin@a4D \sin@a5D \sin@a6D \\
& \sin@q4D \sin@q5D \sin@q6D + a5^2 d2 \cos@a1D \cos@a2D \cos@q3D \cos@q5D^2 \\
& \sin@a3D \sin@a4D \sin@a5D \sin@a6D \sin@q4D \sin@q5D \sin@q6D, 0 <<
\end{aligned}$$