Hybrid Hexapod® Motion is “Hybrid” because it is composed of Serial and Parallel Kinematics

Serial and Parallel Kinematics:
This is a simpler version of kinematics over a 6-axis hexapod due to the simplified calculations.

Controllers process these calculations faster resulting in smoother 3D path motion.
Understanding the Tripod’s role in more precise 6D Motion
Tripod Extension Results in Linear Z-Axis Motion
Tripod Extension & Retraction Results in Angular $T_x$ or $T_y$ Motion

Even at various z-axis locations you can have rotation about the X or Y axes. This is a variable pivot point along the Z axis.
Tripod Extension Results in Angular Tx or Ty Motion

Even at various z-axis locations you can have rotation about the X or Y axes. This is a variable pivot point along the Z axis.

NOTE: With only a tripod, you will ALWAYS have your pivot point on the top face.

Z-Axis Stroke and Angular Travel are Inversely Related
Monolithic XY – The basis for unique Hybrid Hexapod® motion

With an XY stage to translate the tripod Left/Right you then get a “Sweeping” motion about the TCP.

XY Stage:
Top Plate
Middle Plate
Bottom Plate

+Y
Top Plate Translation during Y-Axis Motion

-Y
TCP Manipulation is Easy and Immediate

The term TCP stands for Tool-Center-Point which is a definition of a location in space which all Hybrid Hexapod® motion is programmed about. The TCP can immediately be changed in our software to any point in space. All linear or rotary motion is then defined about that TCP location.

TCP:
- X_TCP = 0
- Y_TCP = 0
- Z_TCP = 100

Link Extension
Link Retraction
XY Translation
TCP Manipulation – Tripod & XY Act together to Sweep about your center point

TCP:
- X_TCP = 0
- Y_TCP = 0
- Z_TCP = 100
TCP Manipulation – Tripod & XY Act together to Sweep about your center point

TCP:
X_TCP = 0
Y_TCP = 0
Z_TCP = 100
TCP Manipulation – Tripod & XY Act together to Sweep about your center point

TCP:
- $X_{TCP} = 0$
- $Y_{TCP} = 0$
- $Z_{TCP} = 100$
TCP Manipulation is Easy and Immediate

Tool Center Point “TCP”: Programmable to any location in space (X_TCP,Y_TCP,Z_TCP)
Let us start sizing a Hybrid Hexapod® for you today...

Begin to specify your Hybrid Hexapod® with three simple questions:
1. What is your desired working volume XYZ?
2. What is your desired angular travel Pitch/Roll?
3. What is your distance to Tool Center Point “TCP” from center of Hybrid Hexapod® worst case?