Autogator

Draft: 2 Last Revised: 8/2/2021

A picture containing miller

Description automatically generated

# Table of Contents

Title Page 1

Table of Contents 2

Bill of Materials 3

Full Stage Setup 4

Full Stage Parts 4

V-Groove Stage 5

V-Groove Stage Parts 5

V-Groove Stage Assembly 6

Chip Stage 7

Chip Stage Parts 7

Chip Stage Assembly 8

Microscope 9

Microscope Parts 9

Microscope Assembly 10

Resources 11

# Bill of Materials

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Item** | **Model #** | **Supplier** | **Quantity** | **Unit Cost** | **Cost** |
| **Stage Parts** | MicroBlock 4-axis Device Stage | MBT402D | ThorLabs | 1 | $2,207.52 | $2,207.52 |
| Pitch and Roll Title Platform | APR001 | ThorLabs | 1 | $593.00 | $593.00 |
| Small Goniometer with 1/2" Distance to Point of Rotation, ±15º Adjustment | GN05 | ThorLabs | 1 | $152.57 | $152.57 |
| Pitch and Yaw Platforms | APY002 | ThorLabs | 1 | $399.30 | $399.30 |
| 25 mm (0.98") One-Axis Motorized Translation Stage, 1/4"-20 Taps | PT1-Z8 | ThorLabs | 2 | $891.66 | $1,783.32 |
| PRM1Z8 - Ø1" Motorized Precision Rotation Stage (Imperial) | PRM1Z8 | ThorLabs | 1 | $964.64 | $964.64 |
| K-Cube Brushed DC Servo Motor Controller | KDC101 | ThorLabs | 3 | $677.41 | $2,032.23 |
| 15 V, 2.4 A Power Supply Unit with 3.5 mm Jack Connector for One K- or T-Cube | KPS101 | ThorLabs | 3 | $35.36 | $106.08 |
| 3D Printed Parts |  | CamachoLab | 8 | $0.00 | $0.00 |
| **Camera Parts** | Zelux 1.6 MP Color CMOS Camera, 1/4"-20 Taps | CSC165U | ThorLabs | 1 | $435.00 | $435.00 |
| XYZ Translation Stage, 2" Travel | LT3 | ThorLabs | 1 | $1,344.00 | $1,344.00 |
| 6.5X UltraZoom, 3 mm FF, Coax | 1-60191 | Navitar | 1 | $1,625.00 | $1,625.00 |
| Universal Mounting Clamp - Use on adapter tubes | 1-6270 | Navitar | 1 | $166.00 | $166.00 |
| 2.0X Mini Adapter | 1-62136 | Navitar | 1 | $680.00 | $680.00 |
| Mitutoyo 10X ICO 0.28 NA, 33.5 mm WD | 1-60227 | Navitar | 1 | $947.00 | $947.00 |
| C-mount Coupler | 1-6010 | Navitar | 1 | $67.00 | $67.00 |
| Fiber Illuminator | OSL2 | ThorLabs | 1 | $990.14 | $990.14 |
| **Oscilloscope** | R&S®RTO2000 oscilloscope | RTO2064 | Rohde & Schwartz | 1 | $60,000.00 | $60,000.00 |
| **Total** |  |  |  |  |  | $74,492.80 |

# Full Setup

A picture containing toy

Description automatically generated

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Item** | **Model #** | **Supplier** | **Quantity** | **Unit Cost** | **Cost** |
| **Stage Parts** | MicroBlock 4-axis Device Stage | MBT402D | ThorLabs | 1 | $2,207.52 | $2,207.52 |
| Pitch and Roll Title Platform | APR001 | ThorLabs | 1 | $593.00 | $593.00 |
| Small Goniometer with 1/2" Distance to Point of Rotation, ±15º Adjustment | GN05 | ThorLabs | 1 | $152.57 | $152.57 |
| Pitch and Yaw Platforms | APY002 | ThorLabs | 1 | $399.30 | $399.30 |
| 25 mm (0.98") One-Axis Motorized Translation Stage, 1/4"-20 Taps | PT1-Z8 | ThorLabs | 2 | $891.66 | $1,783.32 |
| PRM1Z8 - Ø1" Motorized Precision Rotation Stage (Imperial) | PRM1Z8 | ThorLabs | 1 | $964.64 | $964.64 |
| K-Cube Brushed DC Servo Motor Controller | KDC101 | ThorLabs | 3 | $677.41 | $2,032.23 |
| 15 V, 2.4 A Power Supply Unit with 3.5 mm Jack Connector for One K- or T-Cube | KPS101 | ThorLabs | 3 | $35.36 | $106.08 |
| 3D Printed Parts |  | CamachoLab | 8 | $0.00 | $0.00 |
| **Total** |  |  |  |  |  | $8,238.66 |

# V-Groove Stage

Diagram, engineering drawing

Description automatically generated

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Item** | **Model #** | **Supplier** | **Quantity** | **Unit Cost** | **Cost** |
| **Stage Parts** | MicroBlock 4-axis Device Stage | MBT402D | ThorLabs | 1 | $2,207.52 | $2,207.52 |
| Small Goniometer with 1/2" Distance to Point of Rotation, ±15º Adjustment | GN05 | ThorLabs | 1 | $152.57 | $152.57 |
| Pitch and Yaw Platforms | APY002 | ThorLabs | 1 | $399.30 | $399.30 |
| 3D Printed Parts |  | CamachoLab | 4 | $0.00 | $0.00 |
| **Total** |  |  |  |  |  | $2,759.39 |

# V-Groove Stage Assembly

Diagram

Description automatically generated

# Chip Stage

A picture containing LEGO, toy

Description automatically generated

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Item** | **Model #** | **Supplier** | **Quantity** | **Unit Cost** | **Cost** |
| **Stage Parts** | Pitch and Roll Title Platform | APR001 | ThorLabs | 1 | $593.00 | $593.00 |
| 25 mm (0.98") One-Axis Motorized Translation Stage, 1/4"-20 Taps | PT1-Z8 | ThorLabs | 2 | $891.66 | $1,783.32 |
| PRM1Z8 - Ø1" Motorized Precision Rotation Stage (Imperial) | PRM1Z8 | ThorLabs | 1 | $964.64 | $964.64 |
| K-Cube Brushed DC Servo Motor Controller | KDC101 | ThorLabs | 3 | $677.41 | $2,032.23 |
| 15 V, 2.4 A Power Supply Unit with 3.5 mm Jack Connector for One K- or T-Cube | KPS101 | ThorLabs | 3 | $35.36 | $106.08 |
| 3D Printed Parts |  | CamachoLab | 3 | $0.00 | $0.00 |
| **Total** |  |  |  |  |  | $5,479.27 |

# Chip Stage Assembly

Diagram

Description automatically generated

# Microscope

A picture containing LEGO, toy

Description automatically generated

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Item** | **Model #** | **Supplier** | **Quantity** | **Unit Cost** | **Cost** |
| **Camera Parts** | Zelux 1.6 MP Color CMOS Camera, 1/4"-20 Taps | CSC165U | ThorLabs | 1 | $435.00 | $435.00 |
| XYZ Translation Stage, 2" Travel | LT3 | ThorLabs | 1 | $1,344.00 | $1,344.00 |
| Fiber Illuminator | OSL2 | ThorLabs | 1 | $990.14 | $990.14 |
| 6.5X UltraZoom, 3 mm FF, Coax | 1-60191 | Navitar | 1 | $1,625.00 | $1,625.00 |
| Universal Mounting Clamp - Use on adapter tubes | 1-6270 | Navitar | 1 | $166.00 | $166.00 |
| 2.0X Mini Adapter | 1-62136 | Navitar | 1 | $680.00 | $680.00 |
| Mitutoyo 10X ICO 0.28 NA, 33.5 mm WD | 1-60227 | Navitar | 1 | $947.00 | $947.00 |
| C-mount Coupler | 1-6010 | Navitar | 1 | $67.00 | $67.00 |
| 9 Degree Block |  | CamachoLabs | 1 | $0.00 | $0.00 |
| **Total** |  |  |  |  |  | $6,254.14 |

# Microscope Assembly

Diagram

Description automatically generated

# Resources

Materials Spreadsheet:

<https://docs.google.com/spreadsheets/d/1uKSqVUmrxUZ7ezPVBq28kfNJiLnnzXVegU2DCoR1enU/edit?usp=sharing>

Github:

STL Files:

(Github link to STL files)