

	<p align="center"><b>Bill of Material (BOM)</b>  <b>XY-Pen Plotter</b>  XYPP_29_-BOM.docx</p>	Doc. #	XYPP_29_BOM
		Version:	2.0
		Date:	03-10-2023
		page:	1 of 5
		Project #:	<b>XYPP_29</b>

## Index of Change

Version	Description of Change	Name	Date
1.0	Initial	Gangiredla, Varun Kumar	25-09-2023
2.0	Updated after finalized assembly	Choudhary Prithviraj	02-10-2023

## Table of Contents

Index of Change.....	<b>Error! Bookmark not defined.</b>
Table of Contents.....	1
1 Subject.....	1
2 Bill of Material.....	<b>Error! Bookmark not defined.</b>
3 Conclusion .....	4

## 1 Subject

A computer-controlled device that utilizes pens or markers to produce precise and accurate drawings on paper is known as a pen plotter. The objective of our Workshop Mechatronics project is to create a fully operational pen plotter by employing specific components and technologies that demonstrate the seamless integration of hardware, software, and mechanical elements to achieve a specific task.

This document details the Bill of Materials (BOM) for the pen plotter developed and assembled by our team. The product's construction involves a combination of hardware, software, and mechanical components, working harmoniously to generate precise and accurate drawings on paper.

The BOM functions as a comprehensive inventory list, outlining the specific components and technologies utilized in the pen plotter's construction. It emphasizes their pivotal role in achieving the desired functionality and performance of the pen plotter.

Within this document, the presented Bill of Materials offers a thorough inventory of the key components and technologies employed in crafting the pen plotter. These carefully selected elements play a crucial role in enabling the pen plotter's precise and accurate drawing capabilities, showcasing its outstanding functionality and performance.

	<b>Validation Report XY-Pen Plotter</b>	Doc. #	XYPP_29_-BOM
		Version:	2.0
		Date:	03-10-2023
		page:	2 of 4
		Project #:	<b>XYPP_29</b>

## 2 Bill of Material

Bill of Materials							
Item	Description	Material	Source	QTY	Measurement	Unit Price	Total Price
Mechanical Components							
M01	Guiding Shaft 6mm	Steel	University Lab	4	Piece	€ 3.00	€ 12.00
M02	Timing Belt GT2	Nylon	University Lab	1.2	meter	€ 2.06	€ 2.47
M03	M3 Nut	Steel	Hellweg	20	Piece	€ 0.10	€ 1.99
M04	M3 Bolt	Steel	Hellweg	7	Piece	€ 0.09	€ 0.60
M05	M4 Nut	Steel	University Lab	5	Piece	€ 0.10	€ 0.50
M06	M4 Bolt	Steel	University Lab	5	Piece	€ 0.20	€ 1.00
M07	M5 Nut	Steel	University Lab	12	Piece	€ 0.10	€ 1.20
M08	M5 Bolt	Steel	University Lab	12	Piece	€ 0.20	€ 2.40
M09	Wood screw 3.5x30 mm	Steel	Hellweg	9	Piece	€ 0.15	€ 1.35
M10	SS Screws M3x15mm	Steel	University Lab	20	Piece	€ 0.06	€ 1.20
M11	Silicon-Grease		Amazon	4	gram	€ 0.12	€ 0.48
M12	Super Glue		Amazon	8	gram	€ 0.45	€ 3.60
M13	2mm Magnets		Amazon	60	Piece	€ 0.03	€ 1.80
M14	2mm Brass Rod	Brass	Hellweg	0.5	meter	€ 2.39	€ 1.20



## Validation Report XY-Pen Plotter

Doc. #	XYPP_29_-BOM
Version:	2.0
Date:	03-10-2023
page:	3 of 4
Project #:	XYPP_29

Item	Description	Material	Source	QTY	Measurement	Unit Price	Total Price
M19	6mm LMU-N6 linear bearing		University Lab	6	Piece	€ 1.10	€ 6.60
M20	Tension spring 15mm	Steel	Hellweg	2	Piece	€ 0.05	€ 0.10
						<b>Subtotal</b>	<b>€ 45.59</b>
Electrical Components							
E01	ESP32 Board		University Lab	1	Piece	€ 3.20	€ 3.20
E02	Motor Driver L298N		Amazon	1	Piece	€ 3.00	€ 3.00
E03	DC Motor 48:1 geared 6V		University Lab	2	Piece	€ 4.23	€ 8.46
E04	Limit Switch SPDT AC 250V 5A		University Lab	4	Piece	€ 1.00	€ 4.00
E05	Perf-Board 5x7cm		Amazon	1	Piece	€ 2.00	€ 2.00
E06	Screw terminals		Amazon	6	Piece	€ 0.02	€ 0.12
E09	Adaptor 12V (DC Power)		Amazon	1	Piece	€ 16.91	€ 16.91
E10	MOSFET Switch		Amazon	1	Piece	€ 1.30	€ 1.30
E11	49E Hall Sensor		Amazon	4	Piece	€ 0.60	€ 2.40
E12	DC-DC Buck Voltage Converter		Amazon	2	Piece	€ 1.15	€ 2.30
E13	Multi strand wires		Amazon	16	meter	€ 0.19	€ 3.00
E14	Red Push button (18mm)		University Lab	1	Piece	€ 1.00	€ 1.00
						<b>Subtotal</b>	<b>€ 47.69</b>
3D Printed Components							
P01	Encoder Wheel	PLA	University Lab	2	Piece	€ 1.00	€ 2.00
P02	GT2 15T Motor Pulley	PLA	University Lab	2	Piece	€ 1.00	€ 2.00
P03	GT2 15T idler pulley	PLA	University Lab	2	Piece	€ 1.00	€ 2.00

	<b>Validation Report XY-Pen Plotter</b>	Doc. #	XYPP_29-BOM
		Version:	2.0
		Date:	03-10-2023
		page:	4 of 4
		Project #:	<b>XYPP_29</b>

Item	Description	Material	Source	QTY	Measurement	Unit Price	Total Price
P04	X Axis Idler fixture	PLA	University Lab	1	Piece	€ 1.00	€ 1.00
P05	X Carriage	PLA	University Lab	1	Piece	€ 6.00	€ 6.00
P06	Y Axis Motor Fixture	PLA	University Lab	1	Piece	€ 11.00	€ 11.00
P07	Y Axis Idler fixture	PLA	University Lab	1	Piece	€ 8.00	€ 8.00
P08	Y Carriage	PLA	University Lab	1	Piece	€ 16.00	€ 16.00
P09	Base Board Cover	PLA	University Lab	1	Piece	€ 20.00	€ 20.00
						<b>Subtotal</b>	<b>€ 68.00</b>
<b>Grand total</b>							<b>€ 161.28</b>

### 3 Conclusion

The total cost of manufacturing the pen plotter is approximately 161.28 euros, which is significantly less than the permitted cap of 200 euros and in accordance with User requirements.

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