# CNC PLOTTER MACHINE

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ABSTRACT: As the growth of technology and utilization of CNC machine are increased rapidly. The motive behind our project is to design a CNC based plotter machine by using Arduino UNO V3,it is capable to design 2D designs and sketches.It is fabrication of low cost CNC machine . The commands and instructions are given with help of only G codes .G codes are language , by using this person told computer control machine tool.

I. INTRODUCTION

CNC plotter machine is explained as it is based on Arduino controller. CNC is defined as computer numerical control machine in which commands are given with the help of G code and M codes but in this plotter machine command is given with the help of only G codes. G cods are predefined function associated with the movement on machine axis. G codes provide the direction to the pen to move in X,Y,Z directions. For further improvement pen can be changed by laser cutting tool for more accurate working.The aim of our project is to design difficult sketches on paper or surface of metal(in case of laser) . To run it with great accuracy we use two stepper motor for X and Y direction movement and for Z direction we use one servo motor . Stepper motor is used to convert digital pulse into lead screw rotation . In our project we tried to reduce the cost and increased reliability of our project. As in earlier times it was difficult to make typical sketches but because of this CNC plotter machine we are able to design such typical sketches within few minutes.
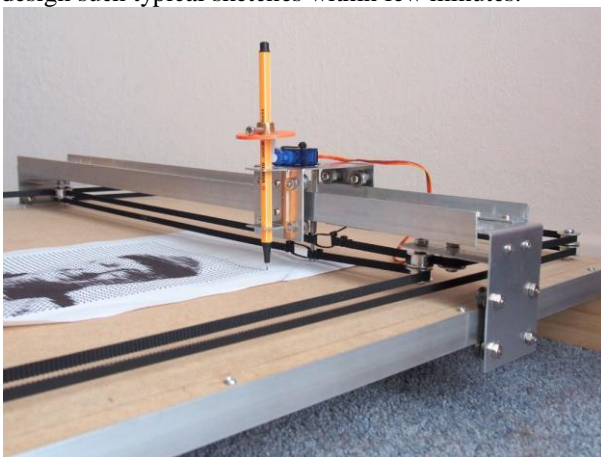
II. METHODOLOGY

We have provide the supply current in Arduino with the help of usb data cable to transfer programme from computer to mother board . In this we have used stepper drivers which provides movement to stepper motor in form of G codes . Our processor which is Arduino is mounted on CNC shield . CNC shield will distribute the current in command of Arduino . CNC shield will help to convert the command of G

codes to digital pulse with help of stepper motor. Stepper motor will move left and right in X direction, stepper motor will be moved front and back in Y direction, servo motor will be moved up and down in Z direction. By using this machine we are able to make some difficult sketches too.

III. PREPARATORY FUNCTIONS

G codes are predefinedfunctions associated with the movement of machine axis. It has two digits, example-G00,G81,G91.It is possible to include more than two address in one single block. G functions are used to defined the path to be followed a complete full design. EX:-

G00-point to point movement
G91-programming in incremental coordinates
G95-specify feed per revolution milling and drilling
G21-input value specified in mm

G code words	Meaning
G0	Rapid Linear Motion
G1	Linear Motion at Feed Rate
G2	Arc at Feed Rate
G3	Arc at Feed Rate
G4	Dwell
G10	Set Coordinate System Data
G17	Plane selection
G20	Length Units
G21	Length Units
G28	Return to Home
G28.1	Set Pre-Defined Position
G30	Return to Home
G30.1	Set Pre-Defined Position
G38.2	Straight Probe
G38.3	Probe
G38.4	Probe
G38.5	Probe
G40	Cutter Radius Compensation
G43.1	Tool Length Offset
G49	Tool Length Offset
G53	Move in Absolute Coordinates
G54	Select Coordinate System
G55	Select Coordinate System
G56	Select Coordinate System
G57	Select Coordinate System
G58	Select Coordinate System
G59	Select Coordinate System
G61	Set Path Control Mode
G80	Canned Cycles Off
G90	Set Distance Mode
G91	Set Distance Mode
G91.1	Arc IJK Distance Modes
G92	Coordinate System Offsets
G92.1	Clear Coordinate System Offsets
G93	Set Feed Rate Mode
G94	Set Feed Rate Mode

IV. CONCLUSION

In this research paper we have used the concept of low cost CNC plotter machine which is easily controlled with the help of computer and easily controlled via computer. This is a low cost project as compare to other CNC machines. The machine is designed with a very simple construction scheme and can be carried anywhere without much effort. Software which is used is open source and user friendly (BANBOX). It is of low cost , easy to control and there is no need of skilled labour.

REFERENCES

[1] Research paper of design and development of CNC plotter by Udit Pandey and Swapnil Raj Sharma.

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