Design and Development of Electric Discharge Machine

Under The Valuable Guidance Of

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(SRPEC)

Group No:-01
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OUTLINE

- Introduction
- Project Objective
- Purpose of Project
- Scope of Project
- Principle of EDM
- EDM Equipment with components
- Important Parameters Of EDM
- Design variable
- Work-Flow of The Project
- Project Planning and Scheduling

- Literature Review
- Industrial Survey
- Pre-Experiment Work on Metal Sheet
- Machine Specification
- Calculation
- Machine setup
- Application , advantage and disadvantage of EDM
- Conclusion

INTRODUCTION

- **Electric discharge machining** (**EDM**), sometimes also referred to as **spark machining**, **spark eroding**, **burning**, **die sinking**, **wire burning** or **wire erosion**, is a manufacturing process whereby a desired shape is obtained using electrical discharges (sparks).

- EDM is mainly used to machine difficult-to-machine materials and high strength temperature resistant alloys. EDM can be used to machine difficult geometries in small batches or even on job-shop basis.

- Work material to be machined by EDM has to be electrically conductive.

- Material is removed from the work piece by a series of rapidly recurring current discharges between electrode and workpiece separated by a dielectric liquid and subject to an electric voltage.

- One of the electrodes is called the tool-electrode, or simply the ‘tool’ or ‘electrode’, while the other is called the work piece-electrode, or ‘workpiece’.

- In WEDM, by using spark generated by wire electrode is utilised for removing of material from work piece.

PROJECT OBJECTIVE

- There are many machining parameters affecting the EDM machine performance and the real mathematical models between machining performance and machining parameters are not easy to be derived because of the complex machining mechanism. The objectives are as follows:-

- 1. To achieve the better surface finish, low surface roughness, better dimensional accuracy and less overall material wastage .

- 2. To reduce the size of machine .

- 3. To significant reduction in the cost of machine.

PURPOSE OF PROJECT

- Extremely hard material to very close tolerances
- Very small work pieces where conventional cutting tools may damage the part from excess cutting tool pressure.
- There is no direct contact between tool and work piece. Therefore delicate sections and weak materials can be machined without any distortion.
- Overall objective is to maintain output parameters like surface roughness, surface finish, accuracy and other output parameters of work piece same as an industrial machine but cost is much lesser than those industrial EDM.
- A good surface finish can be obtained.
- Very fine holes can be easily drilled.
- Reduce power consumption for same machining parameter.
- Increase feed efficiency up to micro level.
- Our main purpose is use in college laboratory for students practical knowledge.

SCOPE OF PROJECT

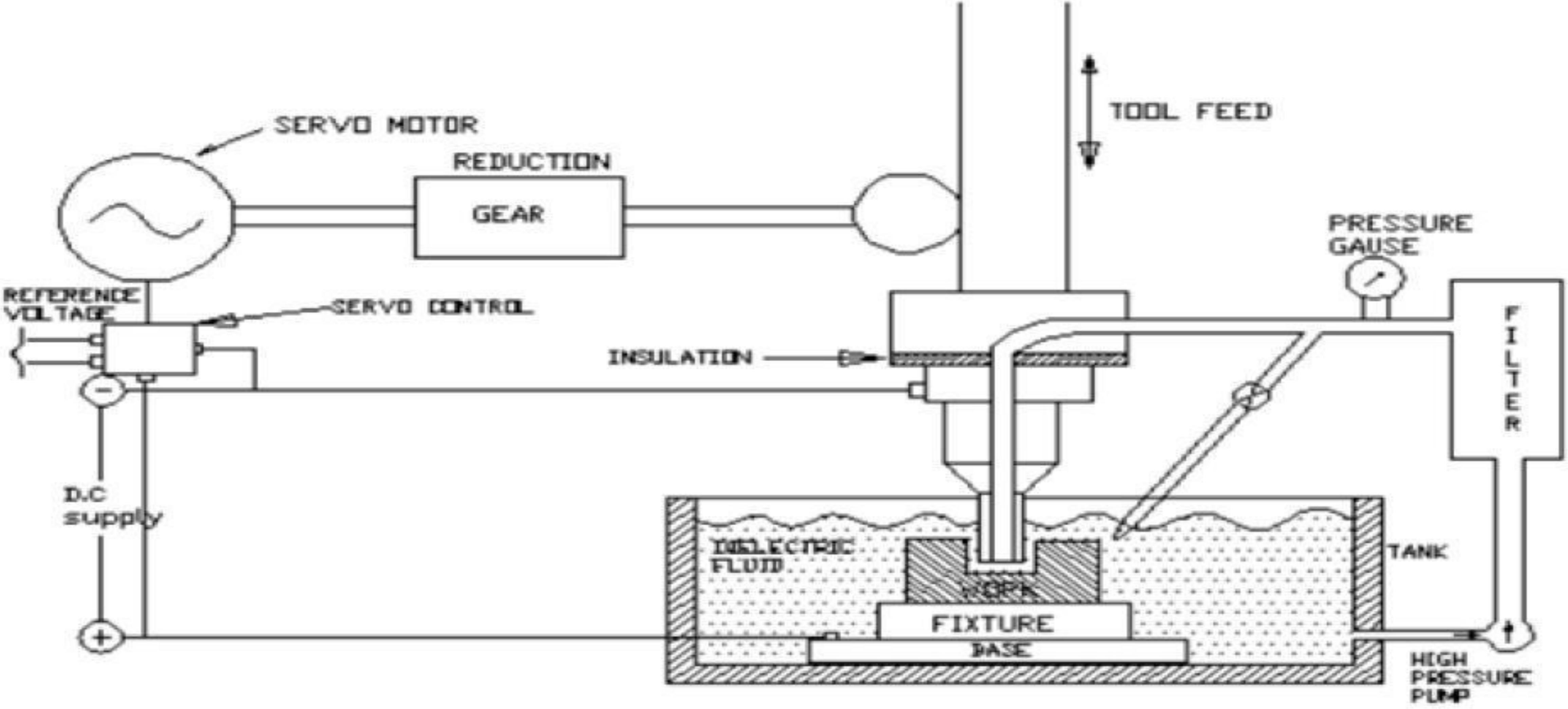
- The laser technology removes the material by burning and produces heat affected zones.

- Problem with water jet and laser technology can be resolved by EDM drilling especially for producing small holes.

- There are some disadvantages of the EDM drilling process for eg. Electrode wear and reduced speed for large holes. These disadvantages in turn can be investigated further for improvement

PRINCIPLE OF EDM

- Electro discharge machining is a thermoelectric process that removes material from the work piece by a series of discrete sparks between a work and tool electrode immersed in a liquid dielectric medium. The method of removal of metal from the work piece is by melting and vaporizing minute amounts of electrode material, which are then ejected and flushed away by the dielectric fluid.



WORKING PRINCIPLE OF EDM

- This Fig. is shown the electric setup of the Electric discharge machining. The tool is cathode and work piece is anode. When the voltage across the gap becomes sufficiently high it discharges through the gap in the form of the spark in interval of from 10 of micro seconds. And positive ions and electrons are accelerated, producing a discharge channel that becomes conductive. It is just at this point when the spark jumps causing collisions between ions and electrons and creating a channel of plasma. A sudden drop of the electric resistance of the previous channel allows that current density reaches very high values producing an increase of ionization and the creation of a powerful magnetic field. The moment spark occurs sufficiently pressure developed between work and tool as a result of which a very high temperature is reached and at such high pressure and temperature that some metal is melted and eroded.

- Such localized extreme rise in temperature leads to material removal. Material removal occurs due to instant vaporization of the material as well as due to melting.

EDM EQUIPMENT

The basic units constituting EDM equipment are :-

- Machine tool structure with work positioning unit.
- Servo head and for tool feed.
- Power supply.
- Dielectric fluid system

MAJOR COMPONENTS

- **Work-piece**-all the conductive material can be worked by EDM.
- **Tool Electrode**-The EDM electrode is the tool that determines the shape of the cavity to be produce.
- **Dielectric fluid**-The EDM setup consists of tank in which the dielectric fluid is filled. Electrode & workpiece submersed into the dielectric fluid.
- **Servo system**-The servo system is commanded by signals from gap voltage sensor system in the power supply and control the feed of electrode & workpiece to precisely match the rate of material removal.
- **Power supply**-The power supply is an important part of any EDM system. It transform the alternating current from the main utility supply into the pulse direct current (DC) required to produce the spark discharge at the machining gap.
- The **DC pulse generator** is responsible for supplying pulses at a certain voltage and current for specific amount of time.

IMPORTANT PARAMETERS OF EDM

- Spark On-time (pulse time or Ton): The duration of time (µs) the current is allowed to flow per cycle. Material removal is directly proportional to the amount of energy applied during this on-time. This energy is really controlled by the peak current and the length of the on-time.

- Spark Off-time (pause time or Toff): The duration of time (µs) between the sparks (that is to say, on-time). This time allows the molten material to solidify and to be wash out of the arc gap. This parameter is to affect the speed and the stability of the cut. Thus, if the off-time is too short, it will cause sparks to be unstable.

- Arc gap (or gap): The Arc gap is distance between the electrode and workpiece during the process of EDM. It may be called as spark gap. Spark gap can be maintained by servo system.

- Discharge current (current Ip): Current is measured in amp Allowed to per cycle. Discharge current is directly proportional to the Material removal rate.

- Duty cycle (τ): It is a percentage of the on-time relative to the total cycle time. This parameter is calculated by dividing the on-time by the total cycle time (on-time pulse off time).

- Voltage (V): It is a potential that can be measure by volt it is also effect to the material removal rate and allowed to per cycle. Voltage is given by in this experiment is 50 V.

- Diameter of electrode : It is the electrode of Cu-tube there are two different size of diameter 4mm and 6mm in this experiment. This tool is used not only as a electrode but also for internal flushing.

- Over cut – It is a clearance per side between the electrode and the work piece after the marching operation.

DIELECTRIC FLUID

- The dielectric generally fluid used are transformer on silicon oil, EDM oil, kerosene (paraffin oil) and de-ionized water are used as dielectric fluid in EDM. Tap water cannot be used as it ionizes too early and thus breakdown due to presence of salts as impurities occur. Dielectric medium is generally flushed around the spark zone. It is also applied through the tool to achieve efficient removal of molten material.

The dielectric fluid has the following functions:

- It helps in initiating discharge by serving as a conducting medium when ionised, and conveys the spark. It concentrates the energy to a very narrow region.
- It helps in quenching the spark, cooling the work, tool electrode and enables arcing to be prevented.
- It carries away the eroded metal along with it..
- It acts as a coolant in quenching the sparks.

TOOL MATERIAL

- Tool material should be such that it would not undergo much tool wear when it is impinged by positive ions. Thus the localized temperature rise has to be less by tailoring or properly choosing its properties or even when temperature increases, there would be less melting. Further, the tool should be easily workable as intricate shaped geometric features are machined in EDM.

SELECTION OF ELECTRODE

- High electrical conductivity – electrons are cold emitted more easily and there is less bulk electrical heating
- High thermal conductivity – for the same heat load, the local temperature rise would be less due to faster heat conducted to the bulk of the tool and thus less tool wear
- Higher density – for the same heat load and same tool wear by weight there would be less volume removal or tool wear and thus less dimensional loss or inaccuracy
- High melting point – high melting point leads to less tool wear due to less tool material melting for the same heat load
- Easy manufacturability
- Cost – cheap

The followings are the different electrode materials which are used commonly in the industry:

- 1. Graphite
- 2 copper
- 3. Tellurium copper – 99% Cu + 0.5% tellurium
- 4. Brass

DESIGN VARIABLE

Design parameters :-

- Material removal rate.
- Tool wear rate
- Over cut (OC)

Machining parameter –

- Discharge current (Ip)
- Pulse on time (Ton)

Constant parameter-

- Duty cycle
- Voltage
- Flushing pressure
- Polarity

WORK-FLOW OF THE PROJECT

Start

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Literature Review

↓

Industrial Survey

↓

Pre-experimental Work

↓

Define All Parameter For Machining

↓

Design all Components of Machine in Design Software

↓

Manufacturing of Different Machine Part

Assembly

↓

Apply Automation in EDM

↓

Experimental Work

↓

Result Analysis Discussion

↓

Conclusion

↓

End

PROJECT PLANNING AND SCHEDULING

	Dec	Jan	Feb	Mar	April	May
Project Define						
Industrial Survey						
Pre-Experimental Survey						
Research on Various Parameters for Machining						
Design Components of Machine in Design Software						
Manufacturing of Different Machine Part						
Assembly						
Apply Automation in EDM						
Experimental Work						

LITERATURE REVIEW

1) **Title: mathematical models for surface roughness, white layer thickness and surface crack density based on response surface methodology (RSM) approach utilizing experimental data.**
Conclusion: From the obtained test results it is evident that peak current and pulse-on duration significantly influence various criteria of surface integrity such as surface roughness, white layer thickness and surface crack density.
The optimal parametric combinations based on the developed models under present set of experimentations for achieving minimum surface roughness, white layer thickness and surface crack density are 2A/20µs, 2 A/20µs and 9 A/20µs, respectively.

2) **Title: hybrid method including a back-propagation neural network(BPNN), a genetic algorithm (GA) and response surface methodology (RSM) to determine optimal parameter settings of the EDM process.**
Conclusion: the higher discharge energy with the increase of discharge current and pulse on time leads to a more powerful spark energy, and thus increased MRR.
REWR decreases with increase of pulse on-time under the same discharge current

3) **Title: Evaluates the effect of current (c), pulse-on time (p) and air gap voltage (v)** on MRR, TWR, and ROC of EDM with Al–4Cu–6Si alloy–10 wt. % SiCP composites.

Conclusion: The significant of the models were checked using technique ANOVA and finding the MRR, TWR and ROC increase significant in a nonlinear fashion with increase in current.

4) **Title: in this paper, an attempt has been made to machining the En-19 tool steel by using U-shaped copper electrode perform on electrical discharge machine.**

Conclusion: The study indicates that, MRR increased with the discharge current (Ip). As the pulse duration extended, the MRR decreases monotonically. In the case of Tool wear rate the most important factor is discharge current then pulse on time and after that diameter of tool. In the case of over cut the most important factor of discharge current then diameter of the tool and no effect on pulse on time.

5) **Title : sink EDM process effect of tool shape and size factor are to be considering in process by using RSM process parameters like discharge current, pulse on-time, pulse off-time, and tool area.**

Conclusion: From the parametric analysis, it is also observed that the interaction effect of discharge current and pulse on-time is highly significant on MRR and TWR, whereas the main factors such as pulse off-time and tool area are statistically significant on MRR and TWR.

6) Title: optimization of EDM parameters using Taguchi's optimization method and Grey relational analysis method.

Conclusion: Using Taguchi method the optimized input parameter combinations to get the minimum surface roughness are 40V gap voltage, 2mm/min wire feed, 6 µs pulse on time, 10 µs pulse off time and similarly optimized conditions to get the minimum kerf width are 50V gap voltage, 2mm/min Wire Feed, 4 µs pulse on time, 6 µs pulse off time.

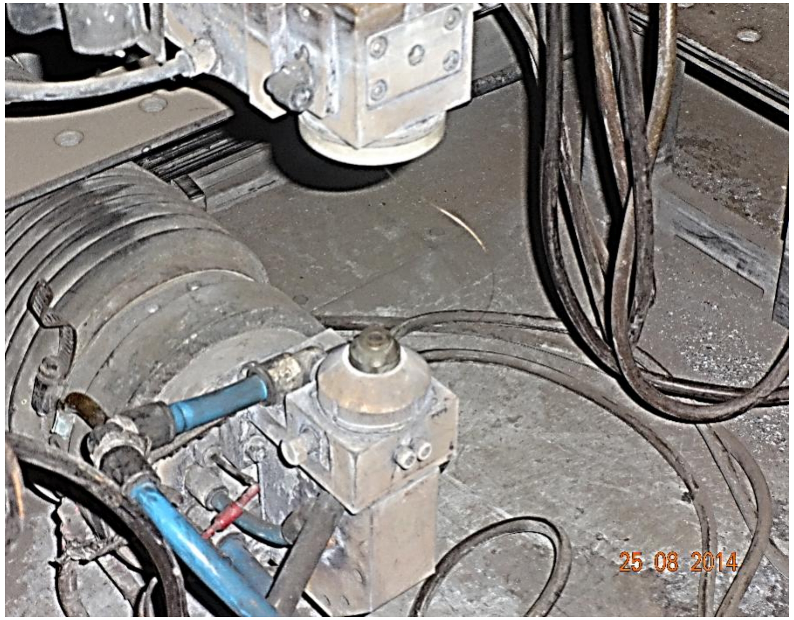
Based on the Grey relational analysis, the optimized input parameter combinations to get both the minimum surface roughness and the nominal kerf width are 50V gap voltage, 2mm/min wire feed, 4 µs pulse on time and 4 µs pulse off time.

Industrial Survey

VISIT OF INDOGERMAN AND CIPET

•At CIPET and INDOGERMAN we show Electric Discharge Machine working model. We show different component of machine and discuss about it.

•We show different work piece which are already machined on EDM.



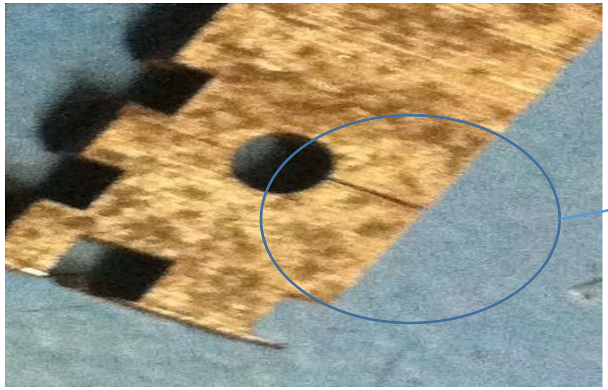
WIRE CUT ELECTRIC DISCHARGE MACHINE

Visit Of the GEC Patan

Electric circuit

Wire Roll

Lubrication Pump, Filter and Tank



Initial gap of 1 mm for insertion of the wire

Cross sectional view of the part

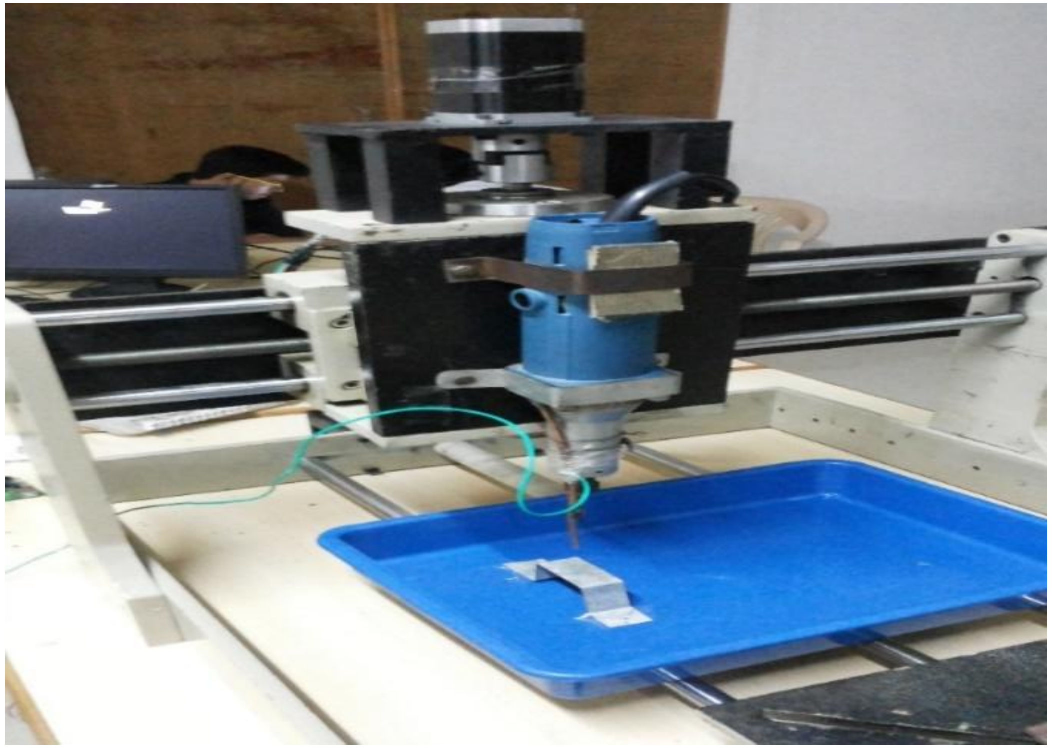
Different complicate shapes can be achieved

Reference of : prof. A G Momin (Work Shop In charge – GEC, Patan)

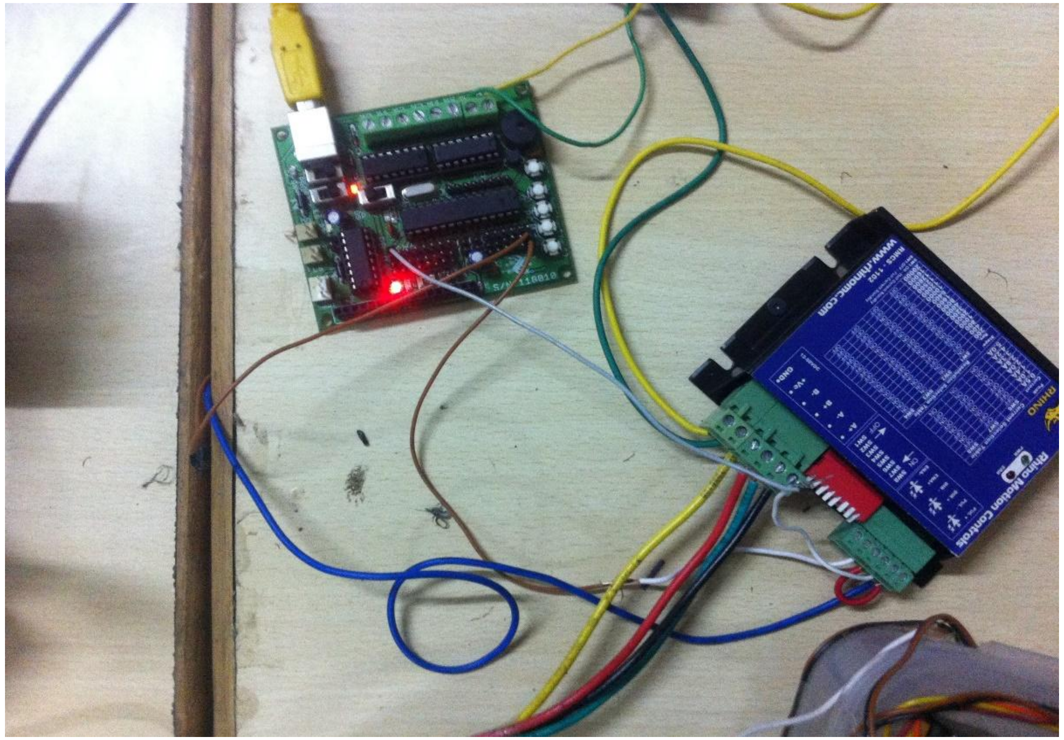
PRE-EXPERIMENT WORK ON METAL SHEET

In our college we experiment on 1mm galvanize iron sheet. We try to cut and make a hole by using 3 mm diameter copper rod. According to experimental set up we arranged all the equipment. By changing different input parameters like voltage, current, pulse on-off time and take an output parameters reading.

Operation or Work	Parameter
Material which cut	Galvanized Iron
Material for Rod	Copper
Diameter of the Rod	3mm
Applied Voltage	35 volt
Applied current	3 Amp



[Pre-Experimental Set-up]



[Experimental set up of Drive and Controller]

A stepper motor is a small brushless synchronous electric motor that can divide a full rotation into a large number of steps. If it is electronically connected to the MCU, the motor's position can be controlled with precision without any feedback mechanism.

[Stepper Motor]

•After completing pre-experimental work on G.I. sheet we do experiment using different parameter with different values.

•Generally in Electric Discharge Machine to generate pulse we use a pulse generator.

•This type of pulse generator specification is Frequency 0.1Hz to 1MHz, Voltage 10-230 V and Pulse Bandwidth 500nSec. To 5sec. and general market price of this type Pulse Generator is 2 lakhs to 3 lakhs. Which is very costlier.

•We try to reduce machine cost during experiment. So, for that purpose we use Relay in place of Pulse Generator. Which is very cheaper than pulse generator.

•For a pulse controlling we use controller (atmega 18) which is connected with Drive (RMCS-1102) and Relay. Here Relay is use for Pulse ON/OFF time up to 5 Micro Second.

•We know that in electric discharge machine by means of electric spark the metal removing operation take place. Here electrode which have good thermal conductivity is used. During operation temperature of electrode is increased and if we not off the current the electrode start to melt. So in electric discharge machine to prevent the melting of electrode pulse off time is necessary. According to electrode and work piece material pulse on-off time is taken.

- We know that during material removing process the distance between electrode and work piece is increased so required distance for spark is change. So for continuous spark generation servo-mechanism is used. Servo mechanism have one servo motor which is operated by controller. Servo mechanism is used for taking a distance between electrode and work piece constant for continuous spark generation.

- We use a pump to flush the material and for the cooling purpose. According to flushing pressure required the pump is taken. The dielectric fluid is also taken according to working condition.

VARIOUS PROBLEMS DURING OPERATION

- During material removing operation first problems occurs is to generate a spark. Due to absence of pulse generator, we use relay controller to control the pulse on-off. So by taking relay according to specification we solve that problems.

- After the completion of power supply problems second problem which occurs is to control the feed of electrode. We use a servo mechanism for electrode feed purpose. By solving various parameters the feed of electrode is decided. We use a drive control unit for taking a feed of electrode in microns. So by using servo mechanism and drive control unit accuracy in feed of electrode is increased.

- Other problems occurs in a design of machine. So we take a help of our guide and according to our guide support we try to improve our design

MACHINE SPECIFICATION

1	Effective Travel:	5OOmm(X) * 700mm(Y) * 10Omm(Z)
2	Machine Outside Dimensions:	6750mm * 1020mm * 450mm
3	Working Table Dimensions:	32Omm*320mm*16mm
4	Sliding Units:	
	X Axis	Dia. 20mm Guide
	Y Axis	Dia. 20mm Guide
	Z Axis	Dia. 20mm Guide
5	Coupling	Love –Joy Coupling
6	Main Materials of Machine	Mild Steel
7	Actual carving precision:	0.0127 mm
8	Repeat positioning accuracy:	0.0127 mm
9	Machine weight:	325 kg
10	Acceptable Processing materials	Any type of Conductive Material

CALCULATION

LEAD SCREW DESIGNS

•Lead screws convert rotary motion to linear motion and come in a wide variety of configurations. Screws are available with different lengths, diameters, and thread pitches. Nuts range from the simple plastic variety to precision ground versions with re circulating ball bearings that can achieve very high accuracy.

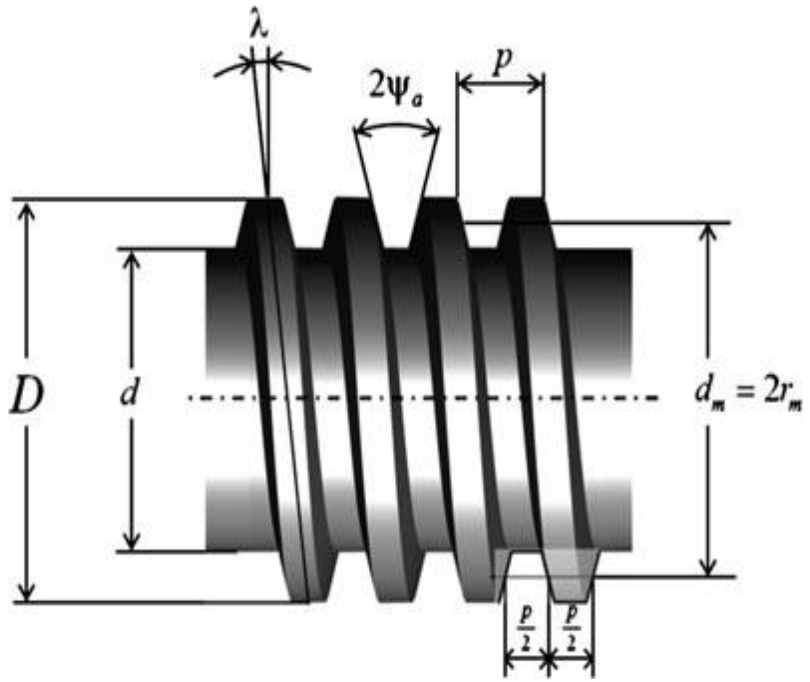
•The combination of micro stepping and a quality leads crew provides exceptional positioning resolution for many applications. A typical 10-pitch (10 threads per inch) screw attached to a 25,000 step/rev. motor provides a linear resolution of 0.000004" (4 millionths, or approximately 0.1 micron) per step.

DRIVE ACCURACY

Step Available on Drive (Rev.)	Increment per One Step (mm)
200	0.0127
400	0.00635
800	0.003175
1000	0.00254
2000	0.00127
3200	0.00079375
4000	0.000635
8000	0.0003175
1600	0.00015875
6400	0.00039688
10000	0.000254
12000	0.00021167
12500	0.0002032
12800	0.00019844
16000	0.00015875
20000	0.000127

Vertical or Horizontal Application:

ST – Screw type, ball or acme
e – Efficiency of screw %
μ_s – Friction coefficient
L – Length of screw inches
D – Diameter of screw inches
P—Pitch threads/inch
W – Weight of load lbs.
F—Breakaway force ounces
Directly coupled to the motor? Yes
CT –Love-joy Coupling



Lead Screw Dimension

Model	Lead Screw		
Axis Name	X	Y	Z
Diameter(mm)	20	20	20
Pitch(mm)	2.54	2.54	2.54

COMMUNICATIONS

- In order for the CNC to process any design implanted into it, the machine must have a connection system between itself and the software being used by the computer. Many connections used today are very common to people from using cable linking to add pictures to their computer hard drive or using a modem connection to log on to the internet.

PARALLEL PORTS

Parallel ports are the most common way of connecting bulk transfer devices to a computer although they are slowly being replaced by USB ports. Unlike the serial port, the parallel port is able to send a byte of information at one time which allows the standard parallel port to send 50 to 100 kilobytes of data per second. The most common use for parallel ports is for printing purposes. There are two major types of parallel ports for printing: the DB-25 shown in Figure

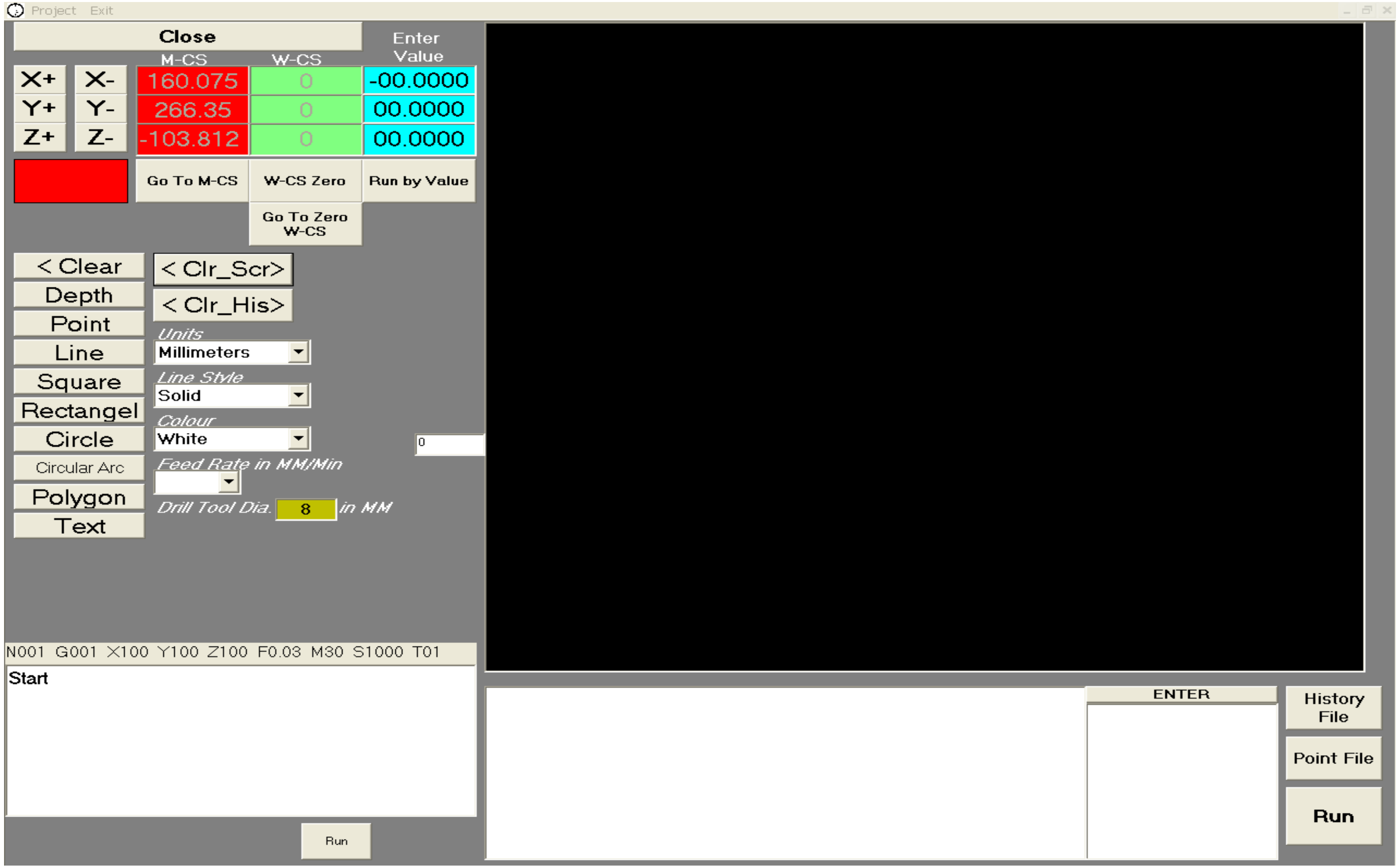
Parallel Port (DB-25)

SOFTWARE

- Low cost, home and small business CNCs require at least one software package to operate. This is the basic package which allows the user to open a graphics file and command the system to machine the part.
- The hand-made software is developed in the visual basic 6.0.

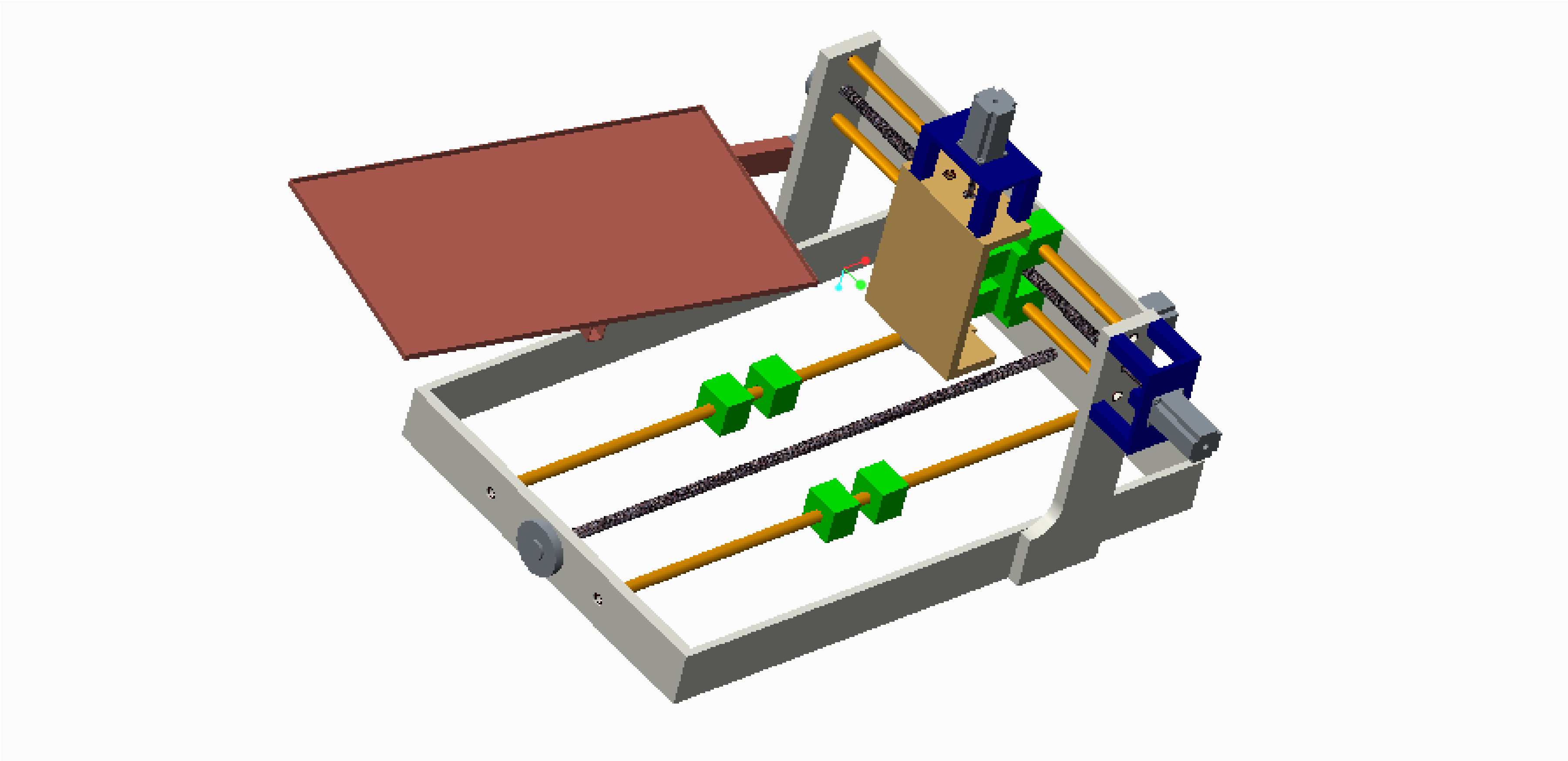
VISUAL BASIC 6.0

It is a very easy programming language to learn. The code looks a lot like English Language. Different software companies produced different versions of BASIC, such as Microsoft QBASIC, QUICKBASIC, GWBASIC, and IBM BASICA and so on. However, people prefer to use Microsoft Visual Basic today, as it is a well-developed programming language and supporting resources are available everywhere. Now, there are many versions of VB exist in the market, the most popular one and still widely used by many VB programmers is none other than Visual Basic 6.



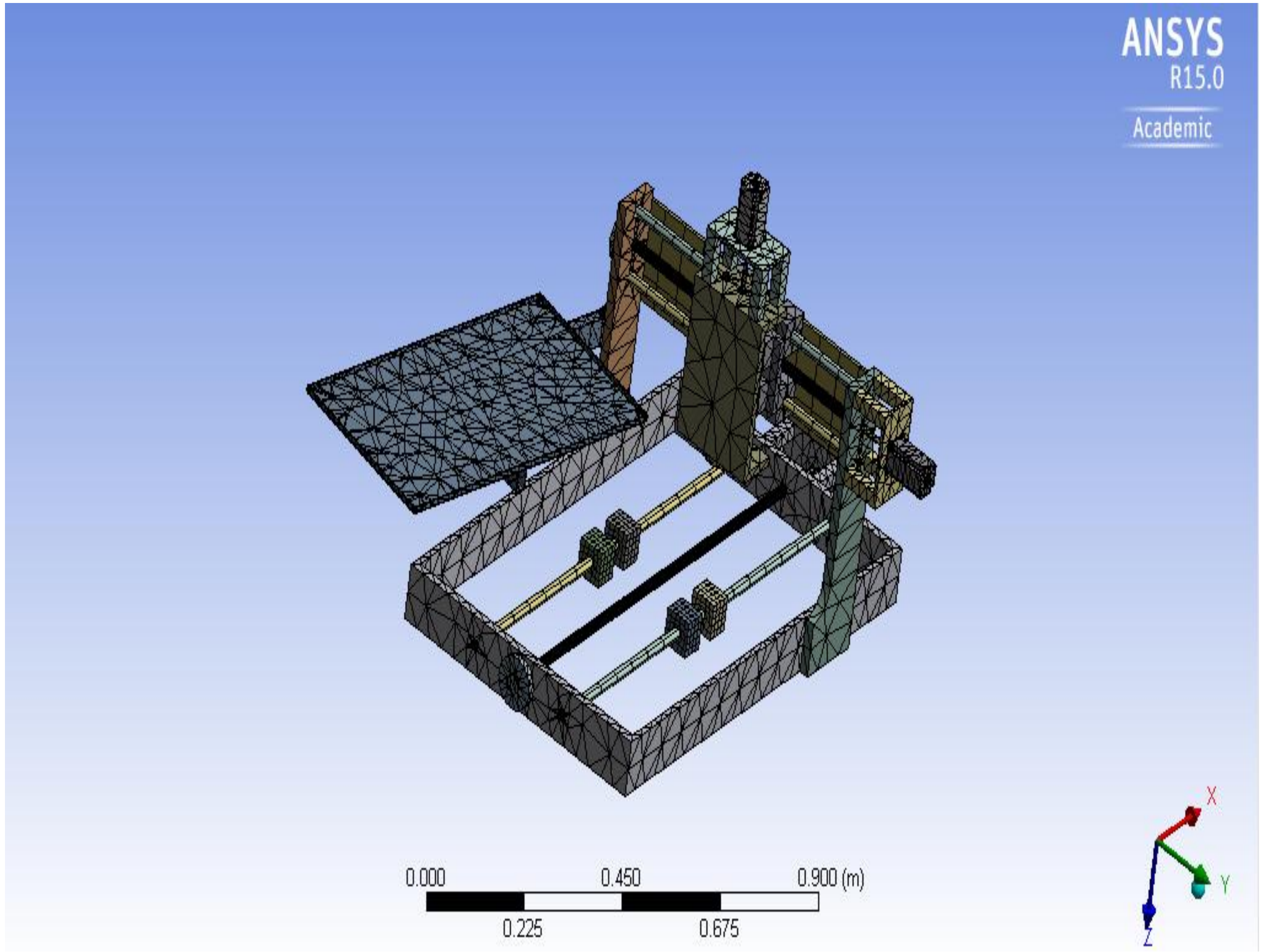
Hand-made software

MACHINE SETUP



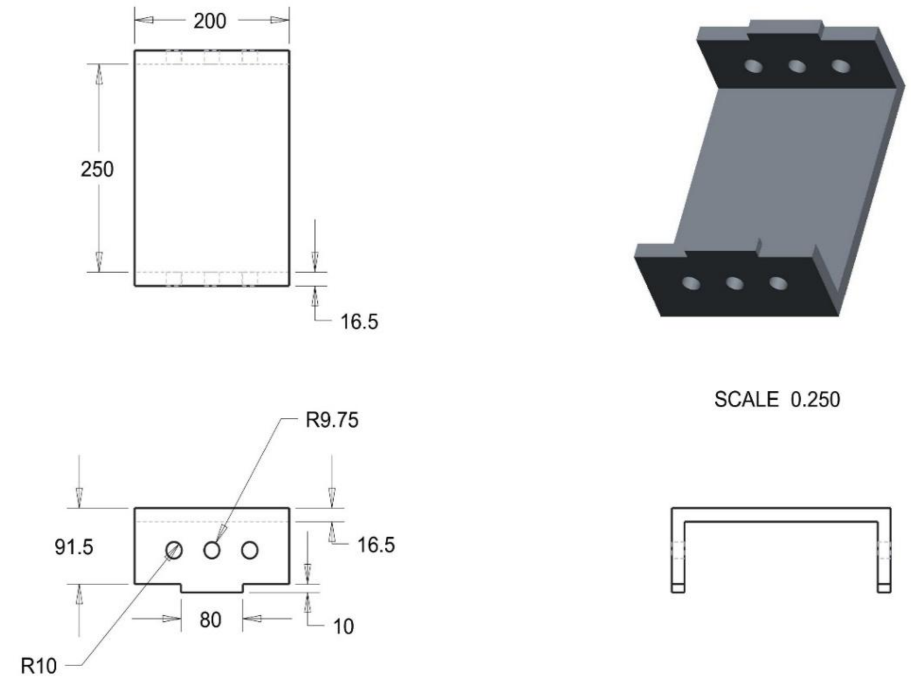
Machine Assembly

ANSYS ANALYSIS

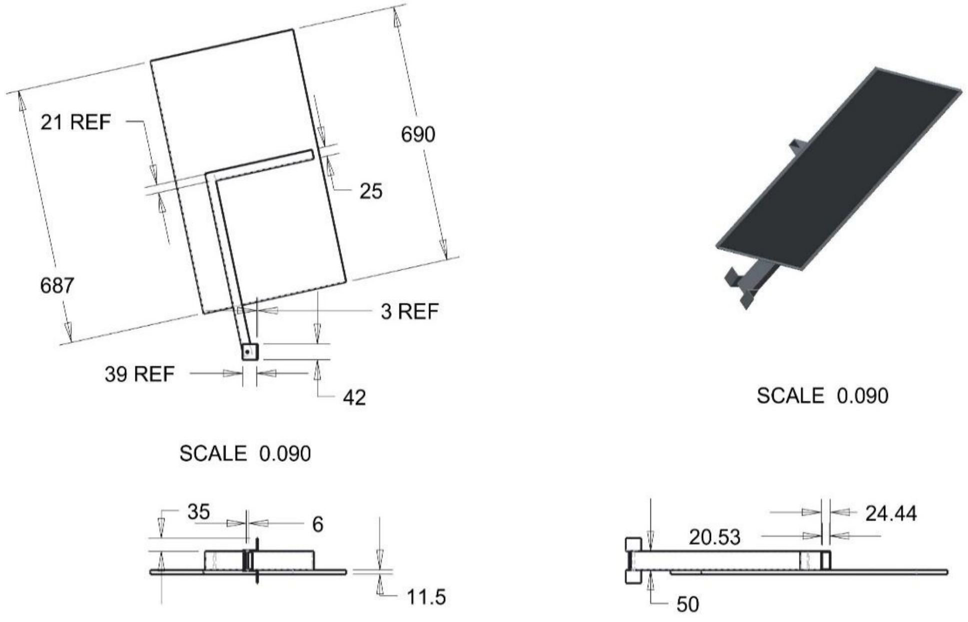


Tensile Ultimate Strength Pa
4.6e+008

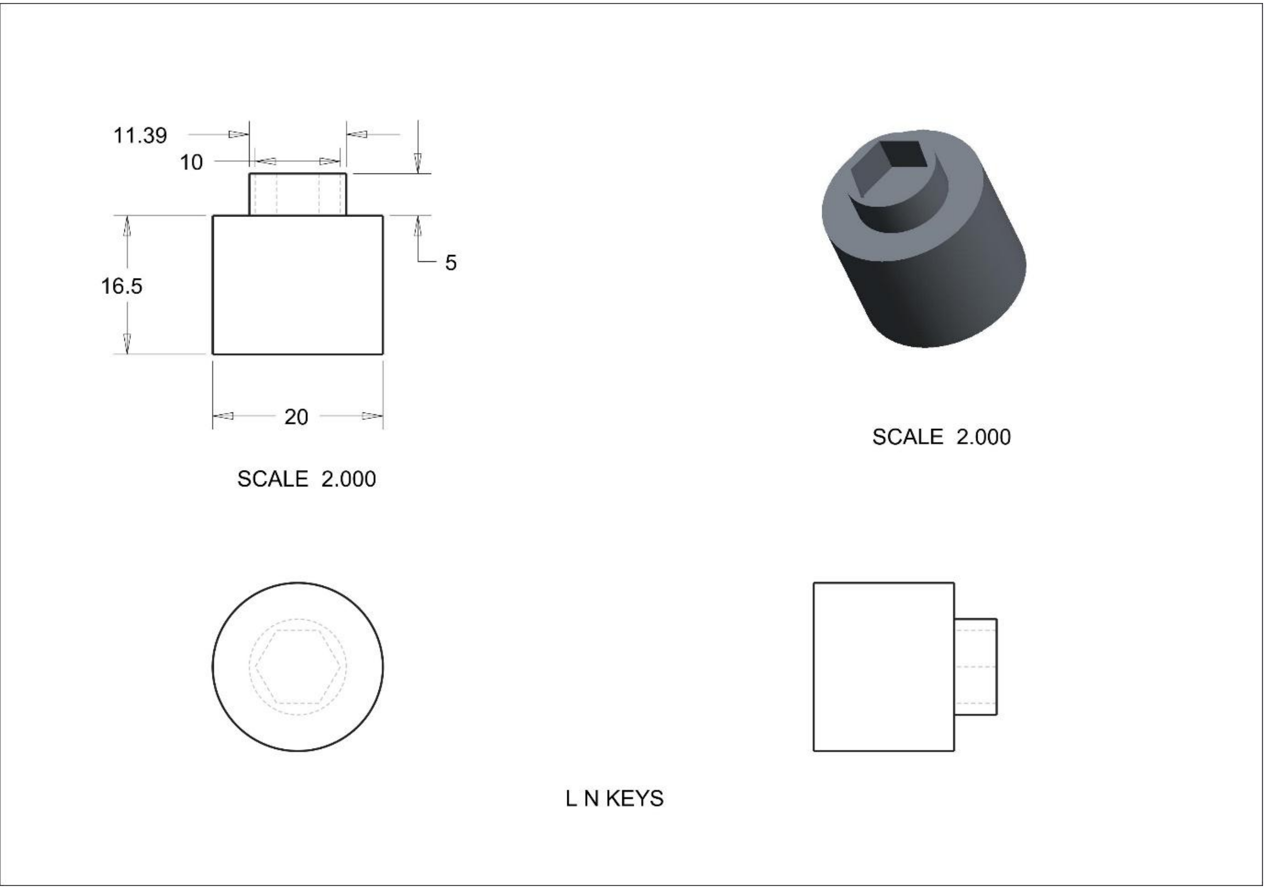
Structural Steel > Tensile Ultimate Strength



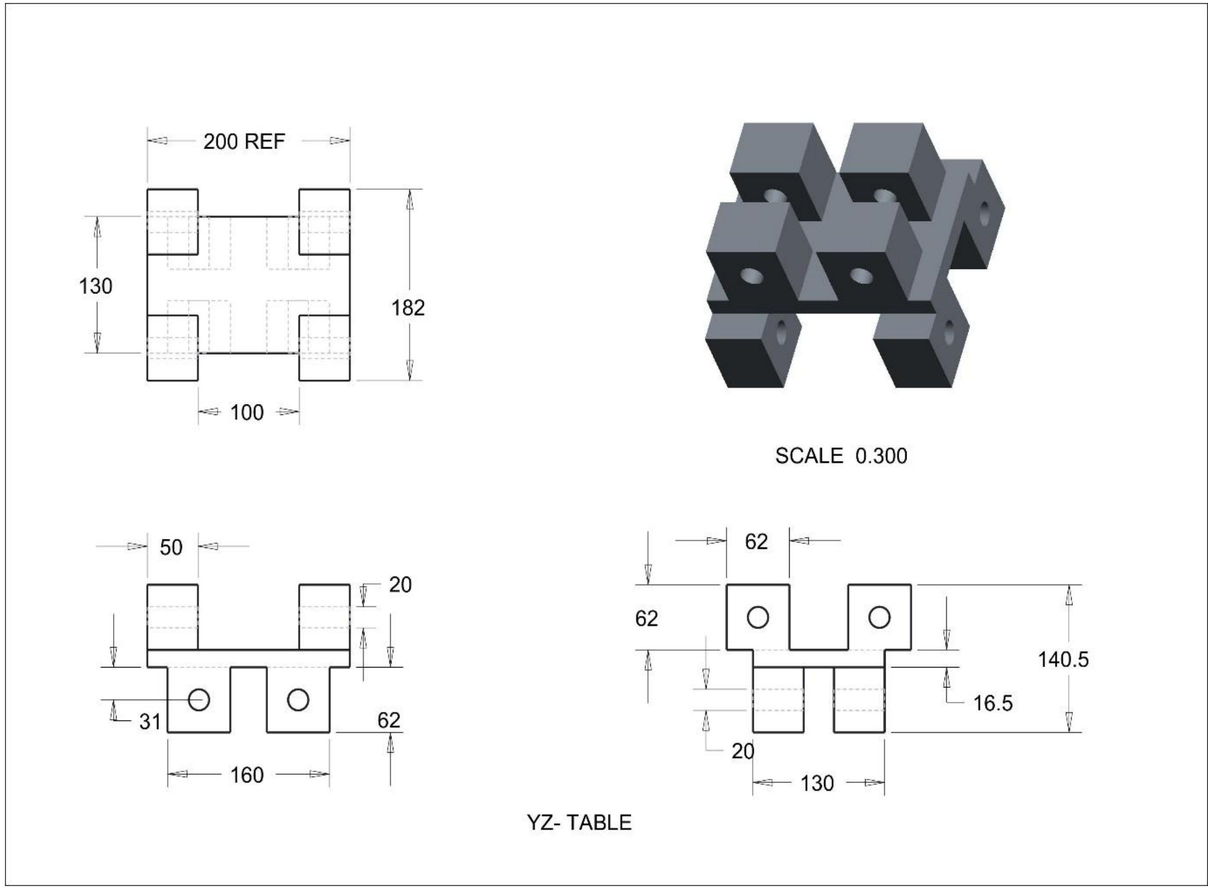
CCLAMP



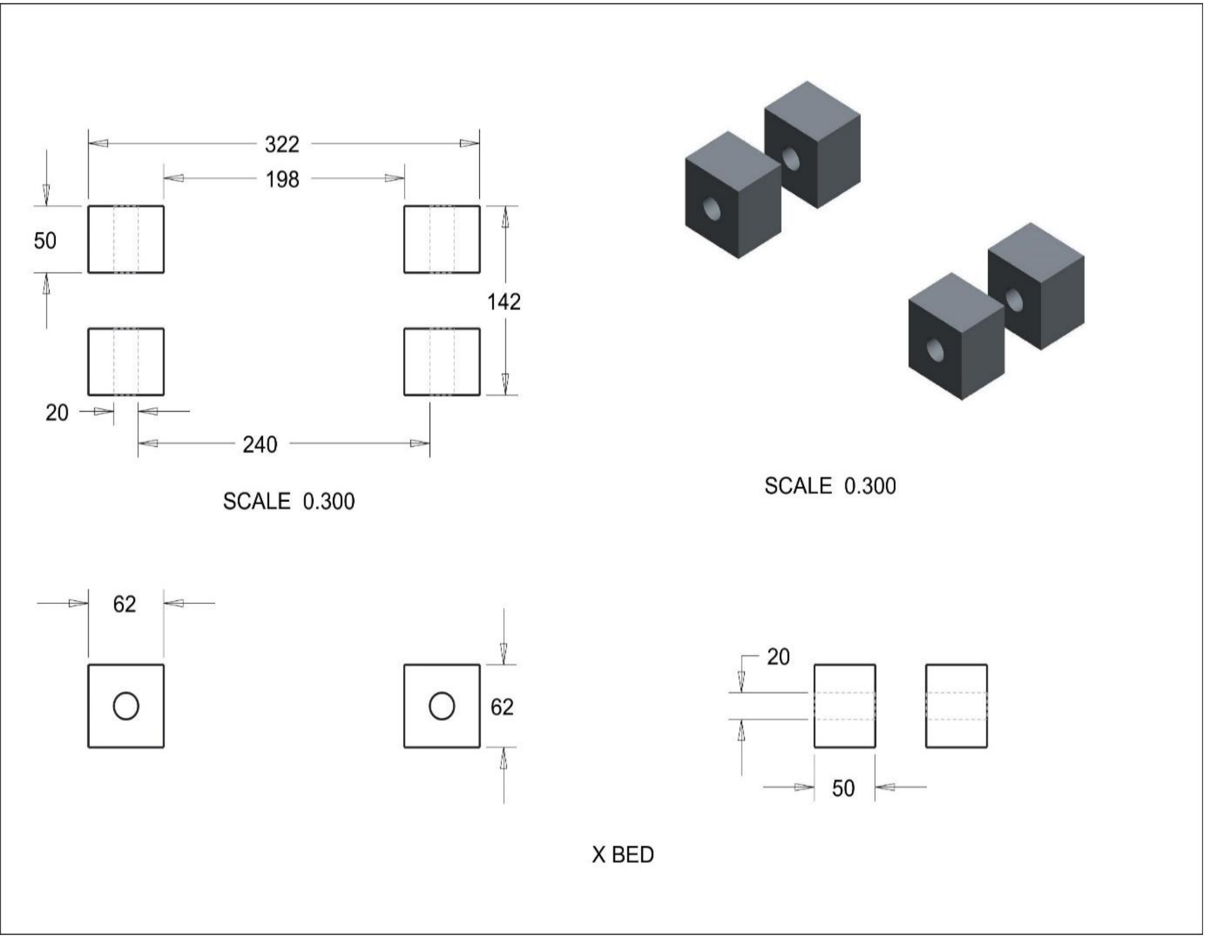
COMPUTER TABLE

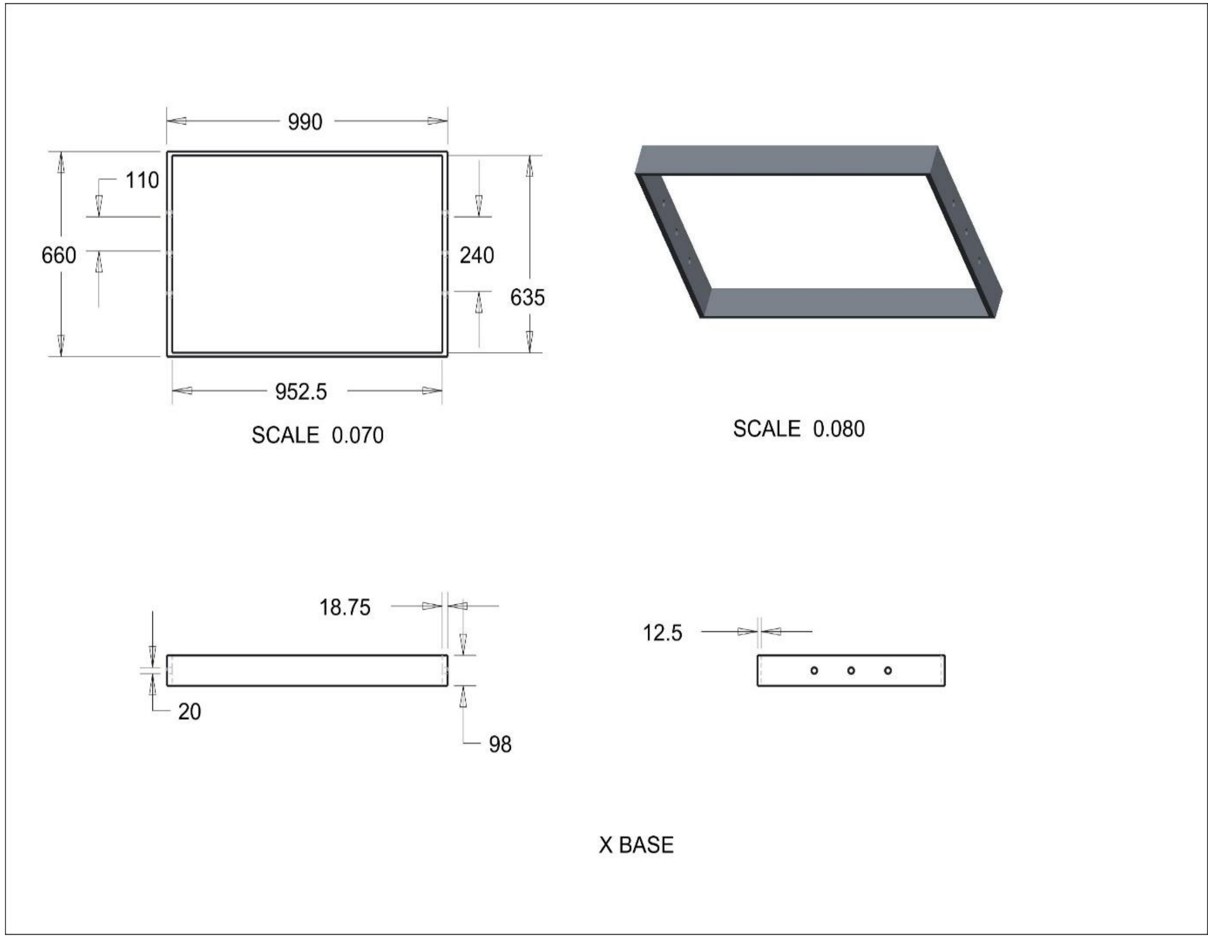


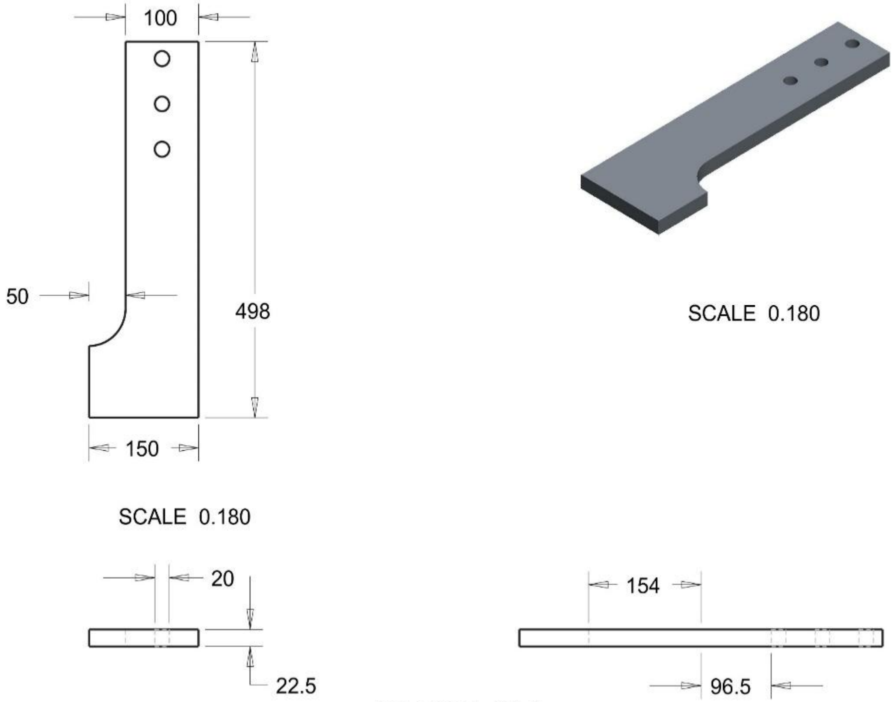
L N KEYS



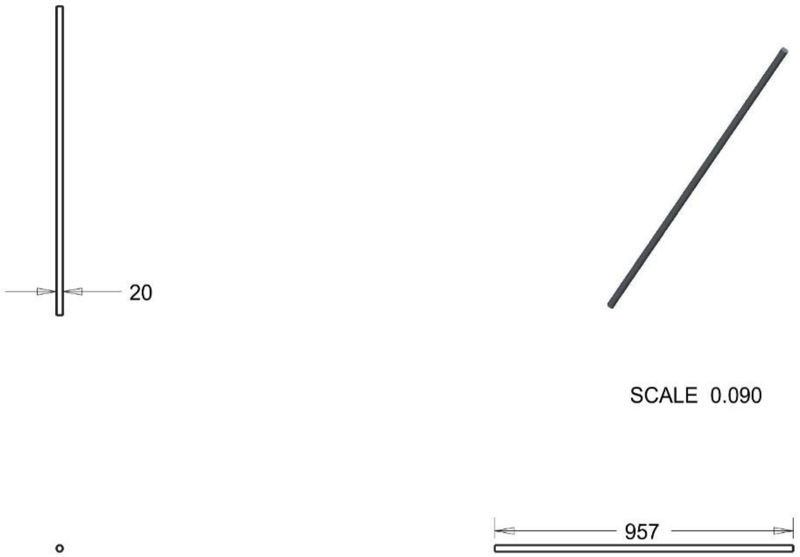
YZ- TABLE


322
198
50
142
20
240
SCALE 0.300
SCALE 0.300
62
62
20
50
X BED

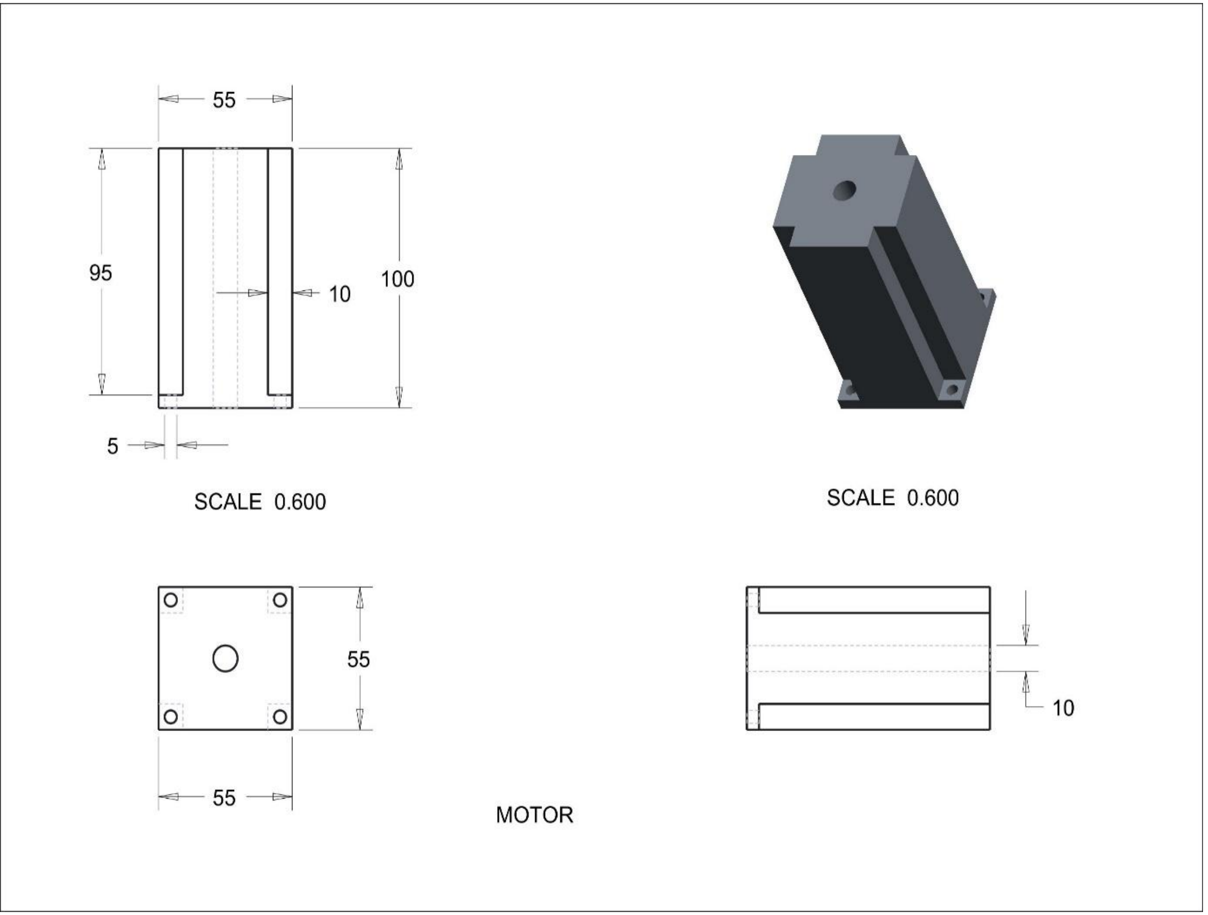

990
110
660
240
635
952.5
SCALE 0.070
SCALE 0.080
18.75
12.5
20
98
X BASE



VERTICAL AXLE



SUPPORTING ROD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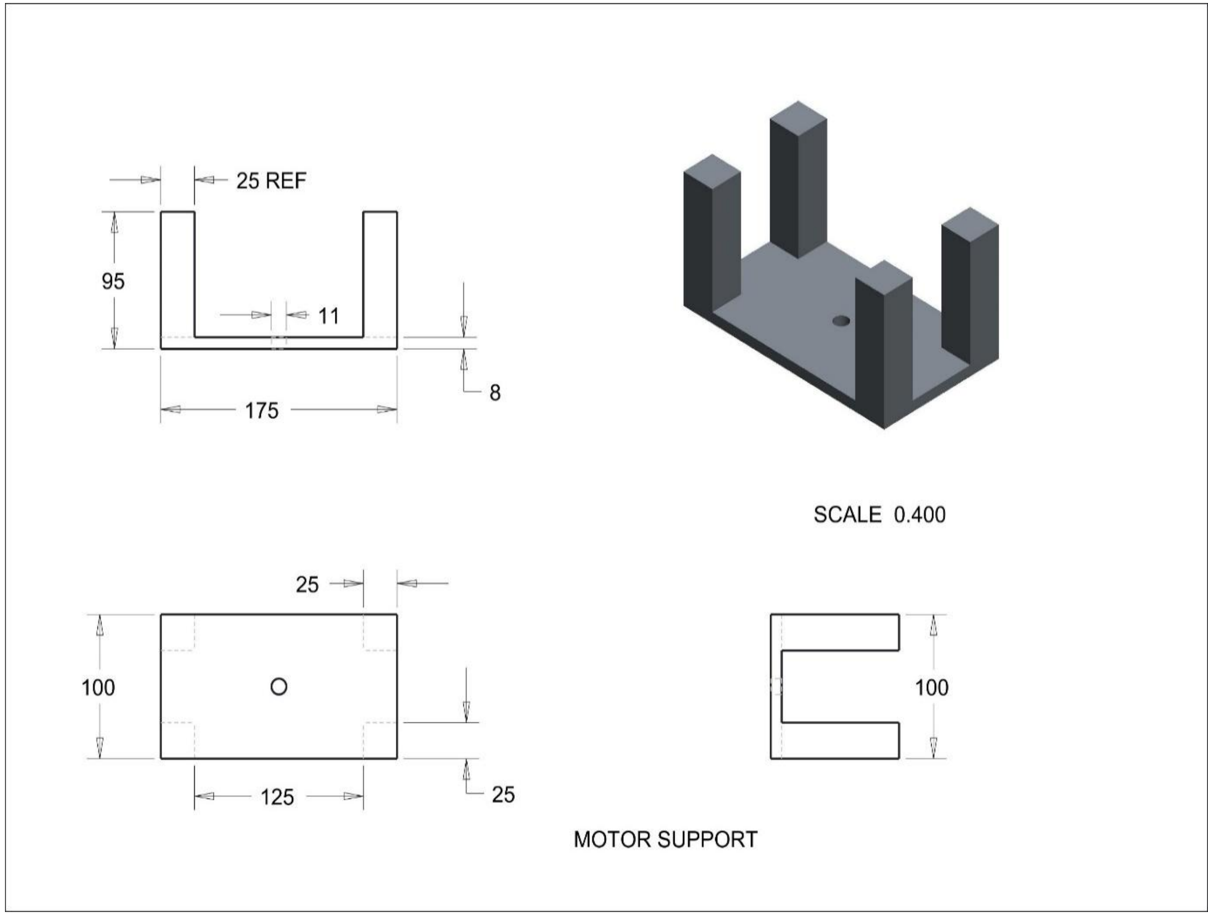
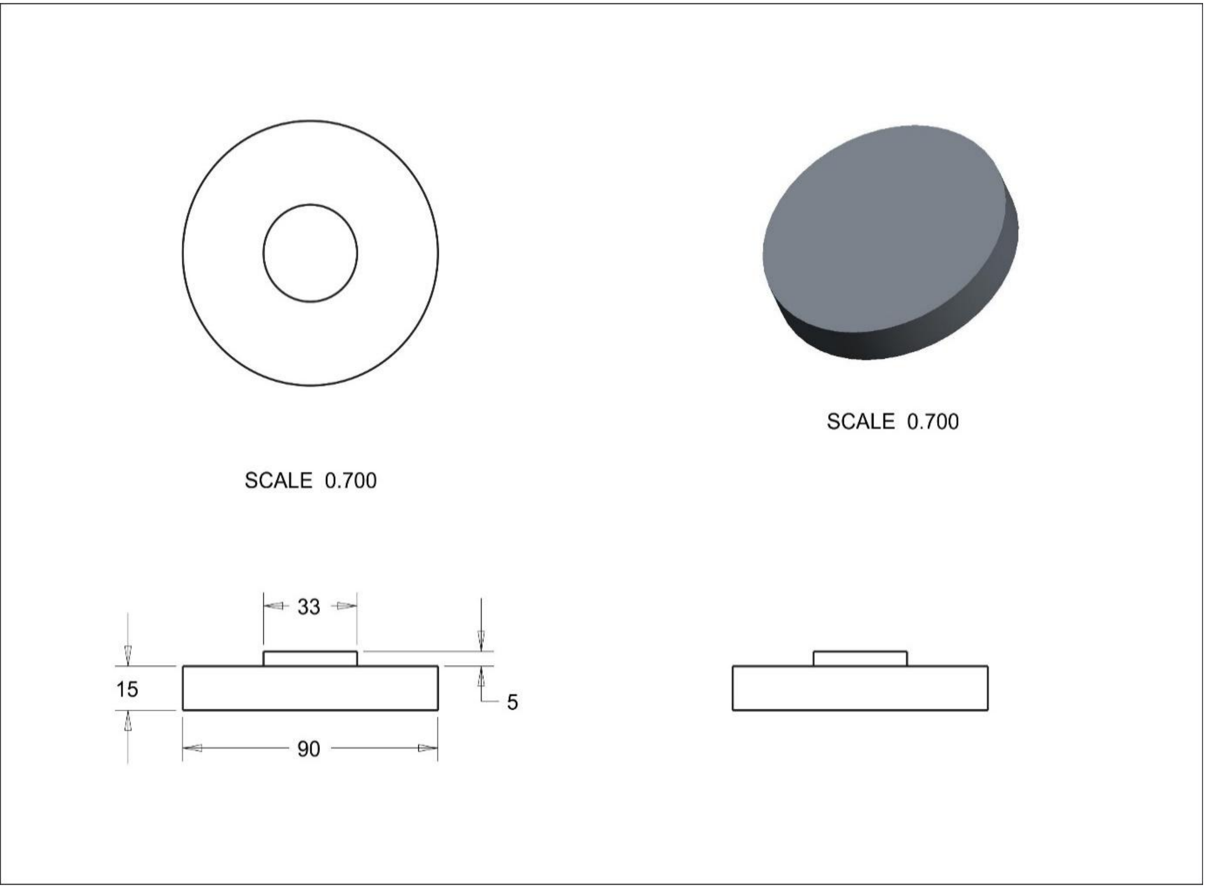
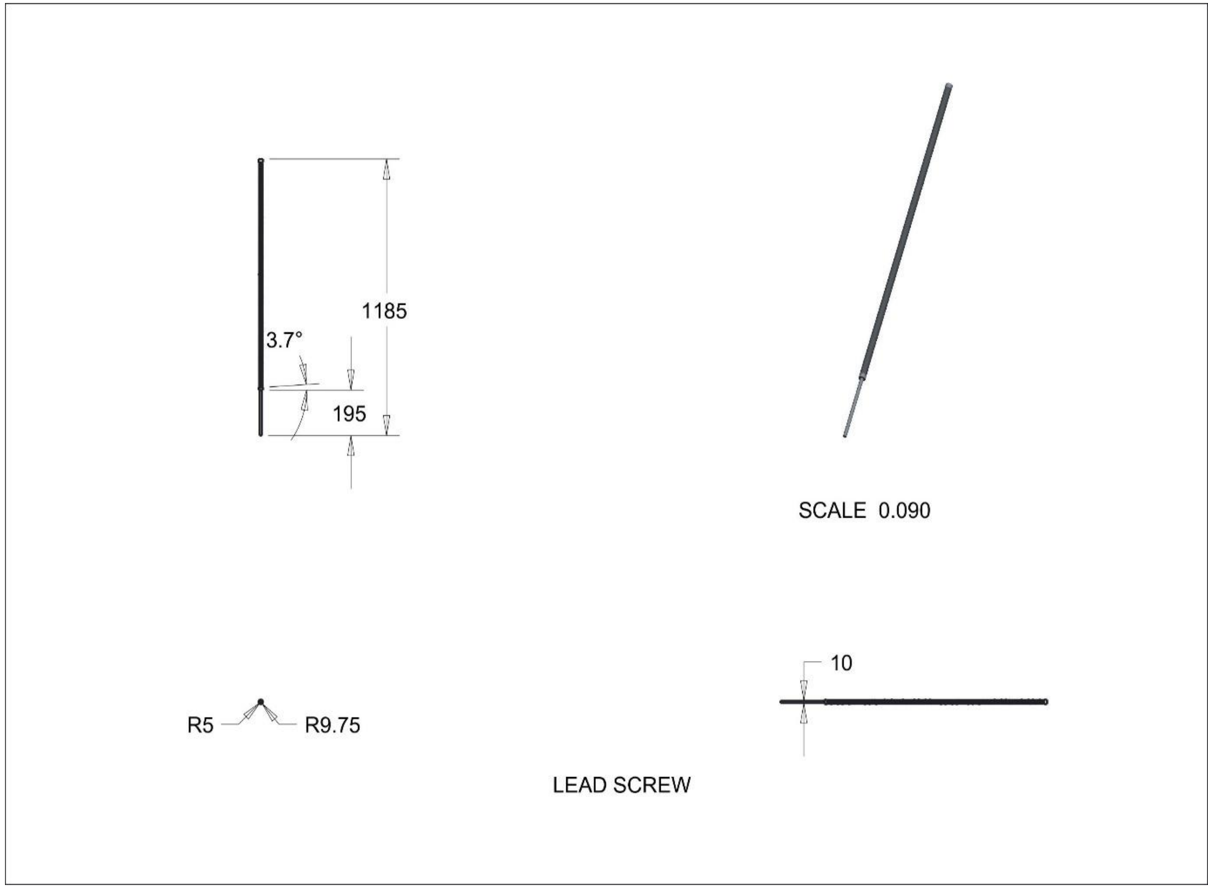
95
10
100
5
SCALE 0.600
SCALE 0.600
55
55
10
55
MOTOR


25 REF
95
11
8
175
SCALE 0.400
25
100
100
125
25
MOTOR SUPPORT


SCALE 0.700
SCALE 0.700
33
15
5
90


1185
3.7°
195
SCALE 0.090
10
R5
R9.75
LEAD SCREW

Specification and Uses of Different Parts

C Clamp :- It support the lead screw and bearing hose and also works as table in z direction. On which we clamp the die and provide the up and down movement to the die.

Computer Table :- Computer table contains two parts. Overhang part contains screen and other part contains three drives for stepper motor, CPU and one switch mode power supply. This part of table contains two exhaust fans for cooling of CPU.

L N Keys :- It is rigid part which used to join different parts of outer body which are made of the cast Iron.

Lead Screw :- There are total three lead screw of different size which provide to and through moment to the table in three different directions.

Motor Support :- Motor support provide base for fitting a motor on the face. It also contains coupling to connect lead screw with motor shaft. And beams of motor support distribute the vibrations of motor

•**Stepper Motor (25 kg):-**Stepper motor are rotated with the help of drive. We use four poll stepper motor with 20000 steps which gives accuracy up to .002 mm feed in each direction.

•**Supporting Rod**:-Supporting rods are used to support the table and distribute all kind of forces, loads and vibration of machining process.

•**Vertical Axle**:-It is flange which holds the tool holder and lead screw of Y direction and its supporting rod

•**Micro-Stepping Stepper Motor Drive 15-50V 5Amp**

•**Switch Mode Power Supply (SMPS):-**A High quality 24V 3A Industrial power supply with Aluminium casing. Ideal for RMCS-11XX series DC motors and DC Integrated Servo products.
Input Voltage: 230V AC
Power Rating: 120W

•**Pump**:-It provides pressurized flow of dielectric fluid which removes the carbon particles from the work piece and eliminate the phenomena of welding.

•**Exhaust Fan**:-It is used for cooling of the CPU and drives of the motor.

•**Acrylic Box**:-Acrylic Box contains fixtures and jigs which are used to hold the work piece in a proper position to give proper dimensional accuracy. We made Acrylic Box transparent to see the spark intensity and proper arrangement of the work piece.

•**Distilled Water (as Dielectric Fluid):-**We use double distilled water as a dielectric fluid which provide proper intensity of spark between the gap of work piece and die. Distilled water needed continuous filtration to remove the metal particles.

APPLICATION OF EDM

1. The EDM process is most widely used by the mould-making tool and die industries, but is becoming a common method of making prototype and production parts, especially in the aerospace, automobile and electronics industries in which production quantities are relatively low.

2. It is used to machine extremely hard materials that are difficult to machine like alloys, tool steels, tungsten carbides etc.

3. It is used for forging, extrusion, wire drawing, thread cutting.

4. It is used for drilling of curved holes.

5. It is used for internal thread cutting and helical gear cutting.

6. It is used for machining sharp edges and corners that cannot be machined effectively by other machining processes.

7. Higher Tolerance limits can be obtained in EDM machining. Hence areas that require higher surface accuracy use the EDM machining process.

8. Ceramic materials that are difficult to machine can be machined by the EDM machining process.

9. Electric Discharge Machining has also made its presence felt in the new fields such as sports, medical and surgical, instruments, optical, including automotive R&D areas.

ADVANTAGES OF EDM

1. Any material that is electrically conductive can be cut using the EDM process.

2. Hardened work pieces can be machined eliminating the deformation caused by heat treatment.

3. X, Y, and Z axes movements allow for the programming of complex profiles using simple electrode.

4. Complex dies sections and moulds can be produced accurately, faster, and at lower costs.
Due to the modern NC control systems on die sinking machines, even more complicated work pieces can be machined.

5. The high degree of automation and the use of tool and work piece changers allow the machines to work unattended for overnight or during the weekends

6. Forces are produced by the EDM-process and that, as already mentioned, flushing and hydraulic forces may become large for some work piece geometry. The large cutting forces of the mechanical materials removal processes, however, remain absent.

7. Thin fragile sections such as webs or fins can be easily machined without deforming the part

LIMITATION OF EDM

1. The need for electrical conductivity – To be able to create discharges, the work piece has to be electrically conductive. Isolators, like plastics, glass and most ceramics, cannot be machined by EDM, although some exception like for example diamond is known.
Machining of partial conductors like Si semi-conductors, partially conductive ceramics and even glass is also possible.

2. Predictability of the gap - The dimensions of the gap are not always easily predictable, especially with intricate work piece geometry. In these cases, the flushing conditions and the contamination state of differ from the specified one. In the case of die-sinking EDM, the tool wear also contributes to a deviation of the desired work piece geometry and it could reduce the achievable accuracy. Intermediate measuring of the work piece or some preliminary tests can often solve the problems.

3. Low material removal rate- The material removal of the EDM-process is rather low, especially in the case of die-sinking EDM where the total volume of a cavity has to be removed by melting and evaporating the metal. Due to the low material removal rate, EDM is principally limited to the production of small series although some specific mass production applications are known.

4. Optimization of the electrical parameters - The choice of the electrical parameters of the EDM-process depends largely on the material combination of electrode and work piece and EDM manufactures only supply these parameters for a limited amount of material combinations. When machining special alloys, the user has to develop his own technology.

CONCLUSION

- FROM THIS PROJECT WE DEVELOP THE MACHINE WHICH HAS HIGHER ACCURACY AND SURFACE FINISH THAN OTHER CONVENTIONAL MACHINE. IT HAS LOW MATERIAL REMOVAL RATE THAN OTHER PROCESS BUT WE GOT BEST DIMENSIONAL ACCURACY.

- WE DESIGN THE DIFFERENT PARTS OF MACHINE LIKE LEAD SCREW, BEARING SUPPORT, DIE HOLDER, JIGS AND FIXTURE, MOTOR AND IT'S DRIVE ACCORDING TO LOAD AND WEIGHT OF DIFFERENT COMPONENTS OF MACHINE.

- FINALLY WE DEVELOP MACHINE WHICH HAS TREMENDOUS ACCURACY OF FEED UP TO 0.000127 MM WITH THE HELP OF DRIVE AND STEPPER MOTOR. IN OUR WORK WE ELIMINATE THE COST OF PULSE GENERATOR BY REPLACING IT WITH A SIMPLE SWITCHING RELAY AND MICRO CONTROLLER.

- THUS WE GOT LOWER SURFACE ROUGHNESS, BETTER DIMENSIONAL ACCURACY AND HIGHER SURFACE FINISH AT A LOWER SPEED AND MODERATE COST.